



SyncSystem

4380A



Software Users Guide

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What's New In This Guide

This is the first release of this document.

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1. General

This manual describes each command and log that the 4380A SyncSystem is capable of accepting or generating. Sufficient detail is provided on the purpose, syntax, and structure of each command or log allowing you to interact with the unit. This guide should enable you to use and write custom interfacing software for monitor and/or control applications.

This manual does not address any of the hardware attributes or installation information. Please consult the *4380A SyncSystem Operations & Maintenance Manual* for the technical information on the unit.

Commands within the text will be *italicized* and all interactions with the system that the user would see are noted in `Lucinda Console` text.

All commands are executed from the command port (1700). Updates to system settings/status are reflected in the settings/status trees, Port 1900 (Status Port), and via Simple Network Management Protocol (SNMP).

2. System Commands

All of the SyncSystem 4380A commands are case sensitive. The system informs the operator when any command has been successfully executed returning an “OK” or other language denoting the command has been accepted and/or executed along with a time stamp. If the system cannot recognize the configuration, status, network or settings parameter the operator is requesting it may return “no info”. Make sure the fields were typed correctly for the data you are attempting to retrieve. If the system recognizes an error was made with the command syntax, it will report an *Error*: and the current time to the operator.

In such cases where one or more data values entered are out of range or are incorrect, the system generates an error message and will leave the current operating value for that parameter unchanged and provide the operator with the acceptable range of values.

The system recognizes alphanumeric characters as well as the dash (-), single quotes ’’, and the underscore ‘_’ when attempting to save configuration files. Use of any other characters is prohibited and strictly enforced and the user will be informed when they attempt to use an illegal filename.

2.1 Command Arguments

- <> An argument is required.
- [] Any arguments contained are optional and can be left out if desired.
- | is used to separate alternative inputs for a single parameter (e.g., On | Off, 1 | 0)
- [n] is an Integer.
- [nf] is a number which may contain a decimal point (e.g., 5.2 or 12 or 0.4).
- [nt] is a time or a length of time.
- <filename> is the name of a configuration or other file that can be set by the user.

2.2 *adjust_pps*

Description: Manually adjust the sub-second time of the system when the steer source is manual.

Usage: *adjust_pps* <-0.5 to +0.5 seconds in 100 nanosecond increments>

Command Examples:
4380A>*adjust_pps* -.25

2.3 *adjust_time*

Description: Manually adjust the time in seconds when the steer source is manual.

Usage: *adjust_time* <-1000 to 1000 seconds>

Command Examples:
4380A>*adjust_time* 15

2.4 *alarm*

Description: Show current alarm state. Displays the current alarm state of the instrument. Equivalent to issuing the *status alarm* command. The returned alarm information provides the most significant alarm condition that is currently active. It does not necessarily indicate all alarm conditions which are currently present. For that purpose, health nodes are used to monitor the current state of the instrument and raise alarms when the specified condition is detected. The health nodes themselves are part of the status tree and can be viewed by typing *status health* at the command prompt.

Once a health node alarm is triggered it will produce one of two types of alarms:

- **Event alarm:** Used to indicate alarms that have occurred but do not have a persistent state. These alarms are latched and will remain active until the user clears them with the *clear_alarms* command. Such an alarm might be triggered by the loss of an external reference because even though the unit may switch to its internal reference and continue to operate, the event is significant and warrants the attention of the user. The event alarms are:
 - clock_phase_step
 - clock_freq_step
- **State alarm:** Used to indicate alarms that represent the current state of the instrument. These alarms remain active until the issue is resolved and the instrument has returned to normal operating conditions. Such an alarm might be triggered by an over temperature event in which the unit has detected elevated temperatures within the instrument. The alarm itself will not clear until the operating temperature returns to normal conditions.

See also: *clear_alarms*, *alarms*

Usage: *alarm* [-d MAX_DEPTH] [NODE]

MAX_DEPTH limit display to MAX_DEPTH levels of data

NODE specifies a node to display

Command Examples:

```
4380A>alarm
```

```
[alarm] power_supply:2 -- AC/DC supply missing, or hardware error  
[OK] 2013-09-04T15:02:04Z
```

If no alarms are present:

```
4380A>alarm
```

```
[alarm] no alarm  
[OK] 2013-09-04T15:03:33Z
```

2.5 alarms

Description: Show active alarms. Displays all currently active alarms on the instrument. Equivalent to issuing the *status health* command except that it only returns those portions of the status tree that have active alarms. The advantage of this command over the *alarm* command is that it provides additional data about the last time the alarm occurred and the number of times it has occurred. However, some failure mechanisms can cause multiple alarms to be triggered and this command can therefore produce extremely verbose output that makes it difficult to determine exactly which alarm is the most important one and likely caused the other alarm conditions.

See also: *clear_alarms*, *alarm*

Usage: *alarms*

Command Examples:

```
4380A>alarms
```

```
[power_supply]  
[2]  
[occurrences] 1  
[set]  
[what] AC/DC supply missing, or hardware error  
[when] 2015-08-30-15:00:52.256  
  
[OK] 2013-09-04T15:01:52Z
```

If there are no alarms active the system will return a blank line.

2.6 altitude

Description: Sets the altitude of the GNSS antenna (Default in meters). If the system is not currently in the manual position mode (given by *settings gnss:positioning:mode*) then it is changed to manual position mode and fixes the position of the GNSS antenna accordingly using the specified altitude and the current latitude and longitude (given by *status gnss:position*).

See also: latitude, longitude, position_mode, fix_position

Usage: altitude HEIGHT [<m | ft>]

HEIGHT Ellipsoidal height in meters (unless 'ft' is specified)

Command Examples:

```
4380A>altitude 51.57399999999998
```

or

```
4380A>altitude 169.206037003 ft
```

Query:

```
4380A>settings gnss:positioning>manual_position:altitude  
[altitude] 5.157399999999998e+01
```

2.7 antenna_delay

Description: Set the GNSS antenna delay. The antenna delay is a critical factor in ensuring that the system is providing accurate timing outputs. The system cannot determine the GNSS signal propagation delay associated with a given GNSS antenna and cable so it must be provided by the user in order to keep the timing signal outputs from being delayed in time.

The antenna delay value (given by *settings gnss:antenna_delay*) should be set to the actual propagation delay of the GNSS antenna and antenna cable. The system will then advance its internal calculation of time by an equivalent amount to offset the delay caused by the GNSS antenna and cable.

Changing the antenna delay value while a system is operating will result in a change in the output signals in order to realign them with the correct time. All signals will remain coherent with one another but the frequency of the system will be altered for a period of time until the output PPS is aligned properly in time.

Usage: antenna_delay <delay>

DELAY GNSS antenna delay in seconds

Command Example:

```
4380A>antenna_delay 9.63E-8 (96.3nSec)
```

Query:

```
4380A>settings gnss:antenna_delay  
9.630000000000000e-08
```

2.8 antenna_voltage

Description: Sets the output voltage on the GNSS antenna connector for the system. This enables the system to provide a GNSS antenna with either 0, +5, or +12 VDC depending upon the antenna requirements. The current setting is given by *settings gnss:antenna_voltage*.

Note: Providing the wrong output voltage to a GNSS antenna can damage the antenna. It is recommended that the +12 VDC setting be used for the standard antenna provided with the system.

See also: `antenna_delay`, `mask_angle`, `position_mode`

Usage: `antenna_voltage <0 | 5 | 12>`

Command Example:

```
4380A>antenna_voltage 12
```

Query:

```
4380A>settings gnss:antenna_voltage
0.0000000000000000e+00      0V
5.0000000000000000e+00      5VDC
1.2000000000000000e+01      12VDC
```

2.9 *clear_alarms*

Description: Clear all alarms. The current alarm condition of the instrument can be retrieved by typing *status alarm* at the command prompt. The returned alarm information provides the most significant alarm condition that is currently active. It does not necessarily indicate all alarm conditions currently present. For that purpose, health nodes are used to monitor the current state of the instrument and raise alarms when the specified condition is detected. The health nodes themselves are part of the status tree and can be viewed by typing *status health* at the command prompt.

Once a health node is triggered it will produce one of two types of alarms:

- **Event alarm:** Used to indicate alarms that have occurred but do not have a persistent state. These alarms are latched and will remain active until the user clears them with the *clear_alarms* command. Such an alarm might be triggered by the loss of an external reference because even though the unit may switch to its internal reference and continue to operate, the event is significant and warrants the attention of the user.
- **State alarm:** Used to indicate alarms that represent the current state of the instrument. These alarms remain active until the issue is resolved and the instrument has returned to normal operating conditions. Such an alarm might be triggered by an over temperature event in which the unit has detected elevated temperatures within the instrument. The alarm itself will not clear until the operating temperature returns to normal conditions.

Executing the *clear_alarms* commands will reset the counters for the number of individual alarm occurrences detected as well as clear any currently latched event alarms.

Usage: `clear_alarms`

Command Example:

```
4380A>clear_alarms
Latched alarms cleared
```

2.10 *config*

Description: Show unit configuration. The *config* command displays all the configuration variables for the system. Configuration variables are values that are set at the factory and are not modifiable by the user. They are physically stored on the hardware so they are not affected by updating the flash on the system. Configuration variables are typically used for hardware configuration specifics such as part number, serial number, or other hardware specifics. This command is equivalent to the *show config* command and the settings variables also appear on the status port (port 1900).

See Also: show, status, settings, config, save, load

Usage: config [-d MAX_DEPTH] [NODE]

MAX_DEPTH limit display to MAX_DEPTH levels of data

NODE specifies a node to display

Command Example:

```
4380A>config
```

2.11 datum

Description: Sets the current datum to be used by the system.

Usage: datum <wgs84 | nad83>. Default is wgs84.

Command Example:

```
4380A>datum wgs84
```

Query:

```
4380A>settings gnss:datum  
wgs84
```

2.12 delete

Description: Delete system configuration settings file. Deletes the specified configuration file from the system. Deleting the settings file simply removes the file for cleanup purposes and has no impact on the current settings of the system.

See also: save, load, list

Usage: delete FILENAME

Command Example:

```
4380A>delete test
```

Users must provide a filename, if not, the system will reject the command and report an error.

```
4380A_60>delete  
FILENAME  
FILENAME      Name of file  
[ERROR] 2013-09-04T15:28:27Z
```

Query:

```
4380A>list
```

This command lists all of the current system configuration files saved by the user.

Note: The user can delete the user “default” file by specifying that filename on the command line. If this occurs and the user does not save the system settings the system will use the factory default settings when restarted/rebooted/power cycled.

2.13 delete_logs

Description: Deletes the specified GNSS logging settings file from the system. Deleting the settings file simply removes the file for cleanup purposes and has no impact on the current settings of the system. To remove specific logs from the current system configuration use the *unlog* command.

See also: save_logs, load_logs, list_logs, save, load, delete, list

Usage: delete_logs <ftp | rt> <filename>
FILENAME Name of file

Command Example:
4380A>delete_logs ftp test

Query:
4380A>list_logs (ftp | rt)

This command lists all of the current GNSS logging configuration files saved by the user. The user must specify ftp or rt for the log type.

Note: The user can delete the logging “default” file by specifying that filename on the command line. If this occurs and the user does not save the log file settings the system will use the factory default log file settings when restarted/rebooted/power cycled.

2.14 diag

Description: Adjust diagnostic levels. Port 1800 is used by the system for diagnostic logging purposes. The port is made available to help in troubleshooting anomalies but potentially outputs a great deal of uninteresting information. Therefore, the diag command is provided to enable a user to select the level of logging desired on the diag port and aid in filtering output that is not of interest.

Many different software modules are incorporated as part of the system and the level of diagnostic logging is set for each module independently. The software module itself has a specific identifier ("kas2" or "gnss" for instance) to enable a user to specify the module they would like to change the amount of diagnostic logging for.

By default, all software modules are set to "info", but there are three levels of diagnostic logging available:

- **error:** Displays only diagnostic output pertaining to error conditions and is the least verbose setting.
- **info:** Displays information only on reasonably significant events that have occurred within the software module.
- **debug:** Most verbose mode displays a great deal of information about routine events within the software module.

To set the level of diagnostic logging the user must specify the module they are interested in and then specify the level of diagnostic logging desired. This will affect the output on the diag port (port 1800) for all network connections.

Usage: diag <clock|cpld4370|gnss|kas2|software|tag|gnss|timecode|tsc4370|warmstart>
<error|info|debug>

Command Example:
4380A>diag gnss debug

Query:
4380A>settings diaglog

```
[clock] info
[cpld4370] info
[gnss] info
```

```
[kas2] info
[lnsrawstate] info
[software] info
[tagnss] info
[timecode] info
[tsc4370] info
[tsgather] info
[warmstart] info
[OK] 2013-09-04T15:30:24Z
```

2.15 diag_port

Description: switch to diagnostic port. Changes the current command port (1700) connection into a diagnostic port (1800) connection. Hitting the <return> key will switch the connection back into a command port connection.

Usage: diag_port

Command Example:

```
4380A>diag_port
```

2.16 diff

Description: Shows the differences between the current settings and the last saved settings. If the application is restarted or rebooted by the user, the system will revert to the previously saved settings.

Usage: diff [--view <tree | flat>] [--nodesonly]
--view Specify the output view. Default is tree.
--nodesonly Output only the names of changed nodes.
i.e., don't display values

Command Example:

```
4380A>diff
```

2.17 fix_position

Description: Sets the position of the GNSS antenna to the specified value. If the system is not currently in the manual position mode (given by *settings gnss:positioning:mode*) then it is changed to manual position mode.

Note: Sending the command with no arguments causes the system to change to the manual position mode and use the current GNSS antenna position (given by *status gnss:position*).

See also: latitude, longitude, altitude, position_mode

Usage: fix_position <lat lon alt>

- lat Latitude of antenna in decimal degrees N
- lon Longitude of antenna in decimal degrees E
- alt Ellipsoidal height of antenna in meters

Note: Once this command is executed, the positioning mode will be manual.

Command Example:

```
4380A>fix_position 38.466279772 -77.440869253 51.5161
```

Query:

```
4380A>settings gnss
```

```
[antenna_delay] 0.00000000000000e+00
[antenna_voltage] 0.00000000000000e+00
[datum] wgs84
[mask_angle] 1.00000000000000e+01
[positioning]
[auto_hours] 1.20000000000000e+01
[manual_position]
[altitude] 5.15161000000000e+01
[latitude] 3.84662797720000e+01
[longitude] -7.74408692530000e+01
[mode] manual
```

2.18 force_time

Description: Manually set the time and enable outputs when GNSS is not available and the steer source is Manual.

Usage: Usage: force_time <default> | <now> | <irig> | <yyyy-mm-dd-hh:mm:ss> | <NTP server address or hostname>

4380A>force_time now

- | | |
|---------------------------|--|
| • force_time default | Sets time to 01/01/2012 00:00:00. |
| • force_time now | Sets time to the operating system's time, if possible. |
| • Force_time irig [year] | Sets the system time to an external IRIG Source. |
| • force_time <date-time> | Sets time to the user specified time. |
| • force_time <NTP server> | Sets time to that of the specified remote NTP server. |

Caution: If the IRIG Timecode selected using the *irig_input* command does not contain the year the user must add the year to the command.

2.19 front_panel_button

Description: Disables the front panel button from resetting the system to the default IP Address. The front panel "DISPLAY" button can be pressed momentarily and the system will display its current IP address using the time display on the front panel. This is extremely useful in determining what IP address the system was assigned without having to log into the box.

If the front panel button is pressed and held for more than 10 seconds then the system will reset itself to the static IP address of 192.168.0.1. This enables a user to then be able to access the box when a dhcp server is not available to assign an IP address to the system.

See also: network, network_config

Usage: frontpanel_button <0 | 1> This command turns the IP Reset feature on the front panel display button on (1) or off (0). This feature is enabled by default (1).

Command Example:

4380A>frontpanel_button 1

Query:

```
4380A>settings hardware:enable_fp_button
True
[OK] 2013-09-04T15:39:39Z
```

False = disabled.

2.20 gps_tracking_timeout:

Description: Set GPS tracking lost timeout alarm in seconds. Default = 1800 seconds.

Usage: gnss_tracking_timeout <seconds>

Query:

```
4380A>settings gps:tracking_timeout
1800
[OK] 2013-09-04T15:41:40Z
```

2.21 help

Description: Display help for a command or list all commands.

Usage: help [COMMAND]

COMMAND Command for which to display detailed help

Command Examples:

```
4380A>help <command>
4380A>h <command>
4380A>? <command>
```

2.22 irig

Description: Select IRIG output type. The 4387A and 4394A output modules enable the user to independently configure an output port to generate a variety of signal formats and timecodes. The 4387A produces modulated signal outputs and the 4394A produces DC-level shifted outputs. By default, the output modules will produce the following signals until reconfigured by the user:

4387A

Port 1: IRIG-B120
Port 2: IRIG-B120
Port 3: IRIG-B120
Port 4: IRIG-B120

4394A

Port 1: Pulse, period=1 s, width=1e-4 s
Port 2: Pulse, period=1 s, width=1e-4 s
Port 3: IRIG-B000
Port 4: IRIG-B000

In order to configure a specific output port the port address must be given. To identify the port address use the slot number and port number of the desired port.

Slot Numbering when looking at the rear panel:

[Slot 1] [Slot 3] [Slot 5]
[Slot 2] [Slot 4] [Slot 6]

Port Numbering when looking at the 4387A or 4394A from the rear panel.

[1] [2] [3] [4]

Valid DC IRIG Codes are A (000,003,007), B (000,003,007), D002, E002, G002, and H002. Valid modulated IRIG Codes are A (130, 133, 137), B (120, 123, 127), E (111, 112, 121), G (141, 142, 147), and H (111, 112, 121, 122, 127).

Configuring a port to generate the IRIG timecode is accomplished using the *irig* command. Multiple IRIG types are supported including IRIG-A, IRIG-B, IRIG-G and IRIG-H. The IRIG code format is specified as a 3-digit number following the code type and is required in order to set the output to the proper format. For instance, for IRIG-B123 the code type is B and the code format is 123.

Configuration of a specific output can be stored on the system itself via the *save* command so that replacement modules will automatically be configured with the correct output format. However, moving the output module to a different slot causes the system to configure the module with the default output format until reconfigured by the user.

See also: nasa36, pps, save

Usage: irig SLOT PORT <alblg> <CODE_FORMAT>

SLOT slot number of the card

PORT port number of the output

CODE_FORMAT three-digit code format

Command Examples:

```
4380A>irig 5 2 G 141
```

Query:

```
4380A> settings hardware:slots:5
[4387]
[ports]
[1]
[format] B
[signal_word] 120
[type] irig
[2]
[format] B
[signal_word] 120
[type] irig
[3]
[format] G
[signal_word] 141
[type] irig
[4]
[format] B
[signal_word] 120
[type] irig
```

2.23 irig_input

Description: Allows the user to specify which input port on the 4383A to use when using the *force_time* command to set the system time. Ports 1 and 2 are DC IRIG and Ports 3 and 4 are AM IRIG. In the example below the irig source is on slot 6, port 4, using AM IRIG B127 as the format. Default is Port 1 enabled using B007.

Note: If the IRIG timecode input does not provide the year as part of the stream (i.e. B120,B000) users will need to add the year to the command as shown below.

Usage: irig_input <slot#> <port #> <irig type> [year]

Command Example:

```
4380A> irig_input 6 4 b127
```

Query:

```
4380A>settings hardware:slots:6
[4383]
[port]
[1]
[enabled] false
[format] B000
[2]
[enabled] false
[format] B000
[3]
[enabled] false
[format] B120
[4]
```

```
[enabled] true  
[format] B127
```

2.24 jam_sync

Description: Synchronizes the system 1 PPS to the GNSS 1 PPS in a 4380A and system 1 PPS to fiber 1 PPS in a downstream 4380A. It will also synchronize the system time to GNSS or fiber accordingly. This command may result in a phase jump of the 1 PPS outputs depending on the state of the unit.

Usage: jam_sync

Command Example:
4380A>jam_sync

2.25 latitude

Description: Sets the latitude of the GNSS antenna. If the system is not currently in the manual position mode (given by *settings gnss:positioning:mode*) then it is changed to manual position mode and fixes the position of the GNSS antenna accordingly using the specified latitude and the current longitude and altitude (given by *status gnss:position*).

See also: longitude, altitude, position_mode, fix_position

Usage: latitude <DEGREES | DD:MM:SS> [n | s]
DEGREES Latitude in decimal degrees N (unless 's' is specified)
DD:MM:SS Latitude in degrees, minutes, seconds N (unless 's' is specified)

Command Examples:

```
4380A>latitude 38.466279772  
4380A>latitude 38.466279772N  
4380A>latitude -38.466279772  
4380A>latitude 38.466279772S
```

Query:

```
4380A>settings gnss:positioning>manual_position  
[altitude] 5.151610000000000e+01  
[latitude] 3.846627977200000e+01  
[longitude] -7.744086925300000e+01
```

2.26 list

Description: Lists the settings files available to load different system configurations. Multiple system configurations can be created and stored using the *save* command and then reloaded later to simplify changing between different system configurations. The configuration files themselves are stored to the flash card so changing the flash card will cause the system to lose the configuration files saved by the user.

Configuration files can contain either an entire system configuration or just a subset of the system configuration. This allows users to change just the portion of the configuration that is of interest and keep the rest of the settings the same. The file named "default" contains the entire system configuration and is the configuration file that is loaded on system startup.

By default the save command stores the entire settings tree to the file named "default". This is the settings file that is loaded at startup, so it defines the settings that the system will be initialized with. Other configurations can be stored by specifying a unique filename.

To view the settings contained within the file simply supply the optional FILENAME parameter and the system will display the file contents. Likewise, if only a subset of the file is of interest, specify the optional FILENAME parameter along with the NODE parameter to view only that portion of the file contents. For instance, *typing list default gnss:positioning* lists the GNSS positioning settings within the configuration file named default.

See also: save, load, show, settings

Usage: list [FILENAME] [NODE]

FILENAME Name of system configuration file

NODE Node name of settings within file. Changes the current command port (1700) connection into a status port (1900) connection.

Command Example:

```
4380A>list
```

Query:

```
4380A>list  
default
```

2.27 list_logs

Description: Lists the settings files available for configuring the GNSS logging utility. Multiple GNSS logs can be requested from the system and the ability to load a saved set of GNSS logs is useful for quickly switching between different configurations or transferring a specific logging configuration from one system to another without affecting other system settings.

To view the settings contained within the settings file simply supply the optional FILENAME parameter and the system will display the file contents. Likewise, if only a subset of the file is of interest, specify the optional FILENAME parameter along with the NODE parameter to view only that portion of the file contents.

See also: save_logs, delete_logs, log, unlog, save, delete, list

Usage: list_logs <ftprt> [FILENAME]

FILENAME Name of GNSS log settings file

Command Example:

```
4380A>list_logs ftp  
default
```

2.28 load

Description: The load command restores the system configuration settings from a file. At startup the system loads the settings in the file named "default", but once initialized, a user can load any of the configuration files previously saved.

The load command will only change those settings that are found in the specified file. If the file contains only a subset of the settings tree, then only those settings will be affected. Also, if a user wishes to only load a subset of the settings within the file, they can specify the specific node within the file that should be loaded. For instance, *load default gnss:positioning>manual_position* will load only the antenna location for the GNSS antenna in manual position mode.

See Also: save, list, show, settings

Usage: load [FILENAME]

FILENAME Name of file

Command Example:

```
4380A>load test
```

Query:

```
4380A>list
default
test
```

2.29 load_logs

Description: Loads the GNSS logging settings from the specified file. If no file is specified, then it loads the settings from the file named "default".

The *load_logs* command supports loading either all of the GNSS logging configuration parameters or only a specific subset of the settings. For instance, if only the list of FTP logs themselves is desired, then a user could type *load_logs ftp default log_selection* to load only the list of the GNSS logs requested for FTP logging.

Multiple GNSS logs can be requested from the system, and the ability to save and load a set of GNSS logs is useful for quickly switching between different configurations or transferring a specific logging configuration from one system to another without affecting other system settings.

See also: *save_logs*, *list_logs*, *delete_logs*, *save*, *load*, *delete*, *list*

Usage: *load_logs* <ftp | rt> [FILENAME]

FILE file to load

Command Example:

```
4380A>load_logs ftp test
```

Query:

```
4380A>list_logs (ftp | rt)
default
test
```

2.30 log

Description: The system utilizes an internal GNSS receiver to provide timing information to the system and enables the system to synchronize its outputs with UTC(USNO). The information available from the GNSS receiver is not limited to timing information and may be of interest to some users. For these users, GNSS logging capability is provided in two different ways:

- rt: Logs are output in realtime on a network port (1135)
- ftp: Logs are stored on the system and retrieved via FTP

Realtime and FTP logs are enabled independently (see *log_enable*) and both methods can be utilized at the same time. Realtime logs are output as soon as they are received from the GNSS receiver on port 1135 and FTP logs are stored by the system so they can be downloaded later using FTP (username: ftp, password: ftp).

The logs available for users to request are limited to logs supported by the GNSS receiver. To see which GNSS receiver is currently in the system type *status gnss:model:hw_version*. The returned value is the GNSS receiver model number. Logs available for Novatel receivers are documented in the OEMV Firmware Reference available on the Novatel website (<http://www.novatel.com>).

FTP and realtime logs currently requested by the user can be viewed by typing *settings gnss_logging:ftp:log_selection* and *settings gnss_logging:rt:log_selection* respectively.

See also: `unlog`, `log_enable`, `save_logs`, `list_logs`, `delete_logs`

Usage: `log`

Novatel: `<rt | ftp> <LOGA> <ontime INTERVAL | onchanged>`

LOGA Name of requested GNSS log (NMEA or ASCII format)

INTERVAL Log update interval in seconds

Command Example:

4380A> `log (ftp/rt) ionutca ontime 7200` (ionutca ontime 7200 is the nova`log` command)

Query:

4380A> `settings gnss_logging:ftp:log_selection`
 `[ionutca] ontime 7200`

2.31 *log_compression*

Description: Enable or disable GZIP compression. The GNSS logs are stored to files that can be retrieved via FTP when FTP logging is enabled. Type `settings gnss_logging:ftp:enable` to determine whether FTP logging is currently enabled. The GNSS log files can be retrieved by using FTP (username: ftp, password: ftp) to download the files from the system.

The storage space on the system for GNSS logs is limited, so enabling GZIP compression of the logs maximizes the amount of data that can be stored on the system. In downloading logs from the system that have been compressed, make sure that they are being transferred as **binary** files to avoid any corruption of the files during transfer. Type `settings gnss_logging:ftp:compression` to determine the current setting for the GNSS log file compression.

See also: `log_enable`, `log_interval`, `log_number`, `log_filename`, `log`, `unlog`

Usage: `log_compression <enable | disable>`

Command Example:

4380A> `log_compression 1`

Query:

4380A> `settings gnss_logging:ftp:compression`
`true`

2.32 *log_enable*

Description: Enable or disable GNSS logging. The system utilizes an internal GNSS receiver to provide timing information to the system and enables the system to synchronize its outputs with UTC(USNO). The information available from the GNSS receiver is not limited to timing information though and may be of interest to some users. For these users, GNSS logging capability is provided in two different ways:

- rt: Logs are output in realtime on a network port (1135)
- ftp: Logs are stored on the system and retrieved via FTP

The `log_enable` command turns the GNSS logging capability on and off for realtime and FTP logs independently. To determine whether realtime or ftp logging is currently enabled, type `settings gnss_logging:rt:enable` and `settings gnss_logging:ftp:enable` respectively.

See also: `log`, `unlog`

Usage: `log_enable <rt | ftp> <enable | disable>`

Command Example:

```
4380A> log_enable rt 1
```

Query:

```
4380A> settings gnss_logging:rt:enable
true
```

2.33 log_filename

Description: Set name pattern of the ftp logs. GNSS logs are stored to files that can be retrieved via FTP when FTP logging is enabled. Type *settings gnss_logging:ftp:enable* to determine whether FTP logging is currently enabled. The GNSS log files can be retrieved by using FTP (username: ftp, password: ftp) to download the files from the system.

The file naming convention used by the system for GNSS logs is one of two types:

- **Timestamp:** The timestamp convention names files according to the start time of the file and a user defined extension. The start time of the file is given in YYMMDDhhmm format and followed by the user defined extension which is useful in distinguishing logs from multiple systems since the start times of the files are often the same. Thus, the final format of the file name will be "YYMMDDhhmm.ext". When *settings gnss_logging:ftp:filename:type* is set to timestamp then *settings:gnss_logging:ftp:filename:suffix* defines the current settings for generating the GNSS log filenames.
- **User:** The user convention names files according to a user specified format that includes a fixed prefix, an incrementing alphanumeric counter, and a fixed suffix. Thus, the final format of the filename will be "prefixCNTRsuffix". The number of digits in the alphanumeric counter is specified by the user. When *settings gnss_logging:ftp:filename:type* is set to user then *settings:gnss_logging:ftp:filename:prefix*, *settings:gnss_logging:ftp:digits*, and *settings:gnss_logging:ftp:suffix* define the current settings for generating the GNSS log filenames.

See also: log_enable, log_compression, log_interval, log_number, log, unlog

Usage: log_filename <user PREFIX DIGITS SUFFIX | timestamp SUFFIX>

PREFIX First part of the filename

DIGITS Number of digits in alphanumeric counter

SUFFIX Last part of the filename (user) or extension (timestamp)

Command Example:

```
4380A> log_filename user Test 4 nov
```

Command Example:

```
4380A> log_filename timestamp <nov>
```

Warning: If the 4380A is currently logging data and you change the file naming convention, you will wipe out all of the log files currently saved in memory. Ensure these files are downloaded prior to making any changes to prevent a possible loss of data.

Query:

```
4380A> settings gnss_logging:ftp:filename
[digits] 4
[prefix] Test
[suffix] nov
[type] timestamp
```

2.34 log_interval

Description: Set GNSS ftp logging interval (minutes). GNSS logs are stored to files that can be retrieved via FTP when FTP logging is enabled. Type *settings gnss_logging:ftp:enable* to determine whether FTP logging is currently enabled. The GNSS log files can be retrieved by using FTP (username: ftp, password: ftp) to download the files from the system.

The size of the GNSS log files is determined by the GNSS log file interval setting. The system will automatically create a new GNSS log file when the current minute of the day modulo the log file interval is zero. Type *settings gnss_logging:ftp:interval* to determine the current setting for the GNSS log file interval.

Usage: log_interval <DURATION>
DURATION Length of log files in minutes

Note: Changing the interval will not impact the log files already stored on the system.

Command Example:
4380A> log_interval 30

Query:
4380A>settings gnss_logging:ftp:interval
30

2.35 log_number

Description: Set max number of GNSS ftp log files. GNSS logs are stored to files that can be retrieved via FTP when FTP logging is enabled. Type *settings gnss_logging:ftp:enable* to determine whether FTP logging is currently enabled. The GNSS log files can be retrieved by using FTP (username: ftp, password: ftp) to download the files from the system.

The maximum number of GNSS log files stored on the system is determined by the GNSS log file number setting. The system will automatically delete the oldest log on the system once the maximum number of GNSS logs is reached or if the system runs out of file space and cannot store any more logs. Type *settings gnss_logging:ftp:file_count* to determine the current setting for the maximum number of GNSS logs.

See also: log_enable, log_interval, log_compression, log_filename, log, unlog

Usage: log_number <LOGS>
LOGS Number of log files to keep

Note: Changing the number of logs on the system will not impact the log files already stored on the system unless the new value is lower than the number of log files currently in storage. If so, the system will delete as many log files as needed to drop the number of logs to the new value starting with the oldest file and working forward.

Command Example:
4380A> log_number 15

Query:
4380A>settings gnss_logging:ftp:file_count
15

2.36 longitude

Description: Sets the longitude of the GNSS antenna. If the system is not currently in the manual position mode (given by *settings gnss:positioning:mode*) then it is changed to manual position mode

and fixes the position of the GNSS antenna accordingly using the specified longitude and the current latitude and altitude (given by *status gnss:position*).

See also: latitude, altitude, position_mode, fix_position

Usage: longitude <DEGREES | DD:MM:SS> [e | w]
DEGREES Longitude in decimal degrees E (unless 'w' is specified)
DD:MM:SS Longitude in degrees, minutes, seconds E (unless 'w' is specified)

Note: Once this command is executed, the positioning mode will be manual and the latitude and altitude values in the manual gnss settings will be in effect.

Command Examples:

```
4380A>longitude 77.44086542274004
4380A>longitude 77.44086542274004E
4380A>longitude -77.44086542274004
4380A>longitude 77.44086542274004W
```

Query:

```
4380A>settings gnss:positioning>manual_position
[altitude] 5.151610000000000e+01
[latitude] 3.846627977200000e+01
[longitude] -7.744086542274004e+01
```

2.37 mask_angle

Description: The mask angle (given by *settings gnss:mask_angle*) determines which GNSS satellites will be used by the system. Any satellite below the specified angle with the horizon will be masked and not used by the system.

This feature is sometimes useful in optimizing system performance in scenarios where there may be unusually high amounts of multi-path associated with the GNSS signal. Using only satellites that are higher in the sky can reduce the amount of multi-path and improve performance but also limits the number of satellites that are tracked. Mask angles that are too high may cause the system to report a loss of GNSS tracking for periods of time.

See also: antenna_delay, antenna_voltage, position_mode

Usage: mask_angle <DEGREES>
DEGREES Mask angle for GNSS antenna in degrees

Command Example:

```
4380A>mask_angle 15
```

Query:

```
4380A>settings gnss:mask_angle
1.000000000000000e+01
```

2.38 nasa36

Description: Select NASA36 output type. The 4387A output modules enable the user to independently configure an output port to generate a variety of signal formats and timecodes. The 4387A produces modulated IRIG signal outputs. By default, the output modules will produce the following signals until reconfigured by the user:

4387A Default Settings:

Port 1: IRIG B120

Port 2: IRIG B120
Port 3: IRIG B120
Port 4: IRIG B120

In order to configure a specific output port the port address must be given. To identify the port address use the slot number and port number of the desired port.

Slot Numbering when looking at the rear panel:

[Slot 1] [Slot 3] [Slot 5]
[Slot 2] [Slot 4] [Slot 6]

Port Numbering when looking at the 4387A from the rear panel:

[1] [2] [3] [4]

Configuring a port to generate the NASA-36 timecode is accomplished using the `nasa36` command. NASA-36 can only be generated by a 4387A output module since it is a modulated timecode.

Configuration of a specific output is stored on the system itself so that replacement modules will automatically be configured with the correct output format. However, moving the output module to a different slot causes the system to configure the module with the default output format until reconfigured by the user.

See also: `irig`, `pps`, `save`

Usage: `nasa36 <SLOT> <PORT>`

SLOT slot number of the 4387A card

PORT port number on the 4387A card the end user is connected to.

Command Examples:

```
4380A>nasa36 5 2
```

Query:

```
4380A> settings hardware:slots:5
      [tsc4387]
      [ports]
      [1]
        [format] B
        [signal_word] 120
        [type] irig
      [2]
        [format] B
        [signal_word] 120
        [type] nasa36
      [3]
        [format] B
        [signal_word] 120
        [type] irig
      [4]
        [format] B
        [signal_word] 120
        [type] irig
```

2.39 network

Description: Show network interface configuration. The `network` command displays all the network interface variables for the system. Network variables are values that are settable by the user and are automatically saved by the system. Network settings are physically stored on the flash though so they will be lost if the flash is replaced. They will not be lost during a software update. This command is equivalent to the `show network` command and the network variables also appear on the status port (port 1900).

See Also: show, status, settings, config, save, load

Usage: network [-d MAX_DEPTH] [NODE]

MAX_DEPTH limit display to MAX_DEPTH levels of data

NODE specifies a node to display

Note: These settings are not necessarily what the system is currently using unless the system has static IP Address assigned. If the system is using DHCP the current IP settings being used by the system will be displayed using the *status unit* command.

Command Example:

```
4380A> network
```

Query:

```
4380A>network
```

```
[broadcast] 192.168.1.255
[default_gateway] 192.168.1.1
[ip] 192.168.1.50
[mode] static
[netmask] 255.255.255.0
```

If = DHCP - check *status unit* for current settings

2.40 network_config

Description: Adjust networking configuration. Network parameters are persistent as soon as they are entered and do not require a user to save them. They also persist through a remote software update of the system but since the network configuration data is physically stored on the flash disk itself, the network settings will be lost if the system is updated using a new flash disk.

The current network settings for the system can be viewed by typing *network* at the command port. It is important to realize though that the IP address given by the *network* command does not necessarily represent the current IP address of the system (type *status Sync System:network:ip* for the current IP address). The network settings actually display the IP address the system will be set to if it is switched to static IP mode. This enables a user to switch back and forth between DHCP mode and static IP mode without losing their network configuration settings for the static IP mode. Likewise, the settings displayed by the network command for broadcast, default_gateway, and netmask provide the values that the system will be configured with only if the system is switched to static IP mode. The current network configuration mode can be viewed by typing *network mode*.

When the system is in DHCP mode the front panel button can be pressed momentarily and the system will display its current IP address using the time display on the front panel. This is extremely useful in determining what IP address the system was assigned without having to log into the box. Additionally, if the front panel button is pressed and held for more than 5 seconds then the system will reset itself to the static IP address of 192.168.0.1. This enables a user to then be able to access the box when a dhcp server is not available to assign an IP address to the system.

See also: network, frontpanel_button, settings, status

Usage: network_config [--mode <dhcp | static>] [--ip ADDRESS] [--mask NETMASK]
[--broadcast BROADCAST] [--gateway ROUTER]

--mode Set the network configuration mode to STATIC IP or DHCP

--ip Set the IP address of the system to ADDRESS

--mask Set the netmask of the system to NETMASK

--broadcast Set the broadcast of the system BROADCAST

--gateway Set the default router for the system to ROUTER

Command Example:

```
4380A> network_config --mode static --ip 192.168.1.50 --mask 255.255.255.0 --
broadcast 192.168.1.255 --gateway 192.168.1.1
```

Note: These network settings will take effect immediately. Users should see “<working>” with a series of periods on the screen. Once the new settings take effect the connection will time out and drop. Users will need to reconnect to the system using the newly assigned static IP Address. These settings are also stored on the system automatically and the system will start up with these settings each time it is rebooted or power cycled.

Query:

4380A>network

```
[broadcast] 192.168.1.255
[default_gateway] 192.168.1.1
[ip] 192.168.1.50
[mode] static
[netmask] 255.255.255.0
```

2.41 position_mode

Description: Set GNSS position mode. An important factor in optimizing the timing performance of this instrument is correctly setting the GNSS positioning mode. Timing performance is impacted by the system's ability (or inability) to determine an accurate position for the GNSS antenna being used and this instrument therefore provides three different modes of operation to be set by the user depending upon the application.

- **Auto:** Auto survey mode is for static applications in which the position of the GNSS antenna is unknown. This instrument will begin an automatic positioning survey in which it averages GNSS data for the specified amount of time (set by the `position_period` command, maximum 12 hours) and then "fixes" the position of the GNSS antenna to the average position value at the end of the survey period. Fixing the GNSS antenna improves the timing performance of the system but it should be noted that a time bias may result from using this mode that can be 30 ns or more but is typically less than 15 ns. At the end of the auto survey period the system also creates a RINEX observation file that can be sent to post-processing services (e.g., SCOUT, OPUS) to determine a precise position for the GNSS antenna and remove this bias. To retrieve the file simply ftp to the instrument (user: ftp, password: ftp), change to the "rinex" subdirectory, and download the observation file located there.
- **Manual:** Manual survey mode is for static applications in which the precise position of the GNSS antenna is known to less than a meter. In this mode, the system uses the user specified settings for position given by `settings gnss:positioning:manual_position`. This is the mode to use if an AUTO survey was done and the RINEX observation file was post-processed to determine a precise position. This mode provides the greatest level of timing performance.
- **Dynamic:** Dynamic positioning mode is for applications in which the GNSS antenna may be moving such as on an aircraft. The position of the antenna is never "fixed" by the instrument since it assumes the antenna is mobile. This is the least accurate mode in terms of timing performance.

The current GNSS position being used by the system can be viewed using `status gnss:position`. Whether or not the position is 'fixed' depends on whether the instrument has set the GNSS antenna to a static value. This is done either at the end of the auto survey period or when the user sets the GNSS antenna position manually. The `position_mode` setting is not ever changed by the instrument and thus if the system settings are saved in AUTO mode then the instrument will begin a new position survey if the instrument is restarted.

WARNING: The position given by the `status gnss:position` command is only a useful diagnostic and is not intended to be used as a precise position of the GNSS antenna for data analysis purposes. For collecting precise GNSS data the realtime GNSS output port (1135) should be used.

See also: position_period, latitude, longitude, altitude, log

Usage: position_mode < auto | manual | dynamic >

Command Example:

```
4380A>position_mode auto
```

Query:

```
4380A>settings gnss:positioning:mode  
auto
```

2.42 position_period

Description: Sets the length of time to use for auto-surveying the GNSS antenna position. At the end of the survey period the position of the GNSS antenna is 'fixed' to the average GNSS antenna location determined during the survey period and a RINEX observation file is created (see 'help position_mode' for a more complete description).

A minimum of 2 hours should be used for auto-surveys but 4-6 hours is recommended and 12 hours (maximum) provides the best solution if time allows. The amount of time remaining in a auto-survey is given by the *status gnss:auto_positioning* command and is reset every time the instrument enters the auto-survey mode. Therefore, if you want to restart an auto-survey you can change the position mode to dynamic and then back to auto.

Changing the position_period (given by *settings gnss:positioning:auto_hours*) during a survey changes the time at which the survey will complete but does not restart the survey. If the position_period is shortened to a time that is less than the time already elapsed in the current survey then the survey will be stopped and the position of the GNSS antenna will be fixed to a static value.

See also: position_period, latitude, longitude, altitude

Usage: position_period <DURATION> [h | m] (Default = 12 hours)

DURATION Length of auto-survey period in hours (unless 'm' is specified)

Command Example:

```
4380A>position_period 10
```

Query:

```
4380A>settings gnss:positioning:auto_hours  
10
```

Note: If the system starts up in auto mode or is switched into the auto mode from dynamic or manual the system will begin averaging over this period to determine the position. While the system is performing this function a countdown timer will show how much time remains before the system determines and fixes its position (*status gnss:auto_positioning*). Once the period expires the antenna position will be fixed (*status gnss:position:fixed = true*) and the system will generate a RINEX file in the rinex directory.

2.43 pps

Description: Select PPS output type. The 4394A module is capable of producing 1 PPS or DC IRIG signals. The 4394A-ECL is only capable of producing a PPS signal. It may be reprogrammed to produce variations of each of these signals on any of the four output ports (4394A-ECL only two). The default settings for pps outputs are:

Ports 1 and 2: pulse, period = 1, width = 1e-4.

In order to configure a specific output port the port address must be given. To identify the port address use the slot number and port number of the desired port.

Slot Numbering when looking at the rear panel:

[Slot 1] [Slot 3] [Slot 5]
[Slot 2] [Slot 4] [Slot 6]

Port Numbering when looking at the 4394A outputs:

[1] [2] [3] [4]

Configuring a port to generate pulses (e.g. 1 PPS) is accomplished using the pps command. Pulse outputs can only be generated on the 4394A output module. Multiple pulse rates and pulse widths can be generated. The period of the pulses is specified in seconds and has a maximum value of 1 second (1 PPS) and a minimum value of 1e-7 seconds (10Mpps). The pulse width has a minimum value of 5e-8 seconds and must not exceed half the value given for the period (i.e. < 50% duty cycle).

Configuration of a specific output is stored on the system itself so that replacement modules will automatically be configured with the correct output format. However, moving the output module to a different slot causes the system to configure the module with the default output format until reconfigured by the user.

See also: nasa36, irig, save

Usage: pps <SLOT> <PORT> <PERIOD> <WIDTH>

SLOT slot number of the card

PORT port number of the output

PERIOD period of pulse in seconds(max of 1, min of 1e-7)

WIDTH pulse width in seconds (minimum of 5e-8)

Command Examples:

```
4380A>pps 1 2 1e-7 5e-8
```

Query:

```
4380A> settings hardware:slots:1
[4394A]
[ports]
[1]
[pps_period] 1
[pps_width] 1.0000000000000000e-04
[type] pps
[2]
[pps_period] 1.0000000000000000e-07
[pps_width] 5.0000000000000000e-08
[type] pps
[3]
[format] B
[signal_word] 0
[type] irig
[4]
[format] B
[signal_word] 0
[type] irig
```

2.44 prompt

Description: Adjust command prompt text or turn the prompt off. The prompt given on the command port (port 1700) can be modified (or disabled) to aid in distinguishing individual systems where more than one system may be present on a network. If the --default" option is specified the prompt will be modified for all new connections, otherwise the prompt will only be modified for the current connection.

Usage: prompt <--text PROMPT_TEXT> <--enable <0|1>> [--default]

text Specify PROMPT_TEXT for the prompt
enable 1 displays the prompt; 0 hides the prompt
default Change the prompt for all future sessions

Command Example:

This command changes it for the current session.

```
4380A>prompt -text Test
Test>           Changes the prompt immediately, only in effect for the current
telnet session.
```

```
4380A>prompt -enable 0
Prompt is no longer visible. This change is only in effect for the current telnet
session.
```

Command Example:

This command makes it the system default.

```
4380A>prompt -text Test --default
4380A>     Note: Prompt does not change until the next command port connection is made.
4380A>prompt -enable 0 --default
4380A>     Prompt is still visible, Prompt does not disappear until the next
             command port connection is made.
```

Query:

```
4380A>settings command_port

[prompt]
[enable] true
[text] Test>
```

Note: Making any changes without the `--default` option will impact the current session and will not impact the system settings. Using the `--default` option will change the system settings (*settings command_port*) values and will be used the next time the user makes a command port connection. These settings must also be saved.

2.45 ptdavg

Description: Set PTD averaging interval in seconds. Changes the PTD (Phase Time Difference) averaging interval for the pulse measurement data displayed on the ptdavg_port (port 2100). The averaging interval is applied to all of the measurement channels and cannot be individually configured on a port by port basis.

Note: This command is only valid when a 4393A PPS measurement module is installed in the system. Default = 10.

Usage: ptdavg <1|10|20|60|300>

Command Example:

```
4380A>ptd 10
```

Query:

```
4380A>settings ptd_port

[averaging_interval] 10
[OK] 2010-05-25T20:31:58Z
```

2.46 ptdavg_port

Description: Switch to averaged PTD port. Changes the current command port (1700) connection into a ptdavg port (2100) connection. Hitting the <return> key will switch the connection back into a command port connection.

The ptdavg port is only available when the 4393A PPS measurement card is installed in the system. The 4393A card accepts an input PPS on four different inputs and measures the time difference between the input PPS and the internal system PPS. Port 2101 provides the raw measurement data for every PPS received and the ptdavg port (2100) averages the raw measurements over the specified interval.

The input channels on the 4393A are identified by the slot that the 4393A is installed in and the port number of the 4393A. The slots in the rear of the system are numbered as follows (looking at the rear panel):

[Slot 1] [Slot 3] [Slot 5]
[Slot 2] [Slot 4] [Slot 6]

Thus, if the PPS input is provided on input 3 of the 4393A card installed in slot 4 it will be identified as 'Ch43' on the ptdavg port.

See also: ptdavg, ptdraw_port

Usage: ptdavg_port

Note: Hit <return> key to switch back to command port

Command Example:

4380A>ptdavg_port

2.47 ptdraw_port

Description: Switch to raw PTD port. Changes the current command port (1700) connection into a ptdraw port (2101) connection. Hitting the <return> key will switch the connection back into a command port connection.

The ptdraw port is only available when the 4393A PPS measurement card is installed in the system. The 4393A card accepts an input PPS on four different inputs and measures the time difference between the input PPS and the internal system PPS. Port 2101 provides the raw measurement data for every PPS received and the ptdavg port (2100) averages the raw measurements over the specified interval.

The input channels on the 4393A are identified by the slot that the 4393A is installed in and the port number of the 4393A. The slots in the rear of the system are numbered as follows (looking at the rear panel):

[Slot 1] [Slot 3] [Slot 5]
[Slot 2] [Slot 4] [Slot 6]

Thus, if the PPS input is provided on input 3 of the 4393A card installed in slot 4 it will be identified as 'Ch43' on the ptdraw port.

See also: ptdavg, ptdavg_port

Usage: ptdraw_port

Note: Hit <return> key to switch back to command port

Command Example:

4380A>ptdraw_port

2.48 quit

Description: Closes your command connection.

Syntax: quit (or exit)

Command Example:
4380A>quit (or exit)

2.49 reboot

Description: Reboot the operating system. By default the system will perform a warm reboot in which the outputs of the system and current settings will be preserved during the reboot process. Specifying a cold reboot will reset the system settings to their saved values and perform a complete reset of the hardware which will result in a loss of output signals.

Usage: reboot [--cold]

2.50 reference

Description: Select reference source. The system has the capability of using either its own internal frequency reference or an external frequency reference. If an external frequency reference (e.g., cesium, MASER) is available that is more stable than the internal reference then the timing performance can be enhanced by utilizing the external source as the frequency reference for the system.

If an external reference is specified (given by *settings reference:source*) the system internally switches to use the 10 MHz input provided to the system.

The timescale option is valid if a 4393 module is available and 2 or more clocks are input to the module. When timescale is selected the system effectively uses the ensemble of clocks plugged into the 4393 module as the frequency reference enhancing timing performance and system redundancy. Clocks must be added via the 'add_clock' command and the timescale filter reference must be set before the timescale will function.

Usage: reference < internal | external | timescale >

Command Example:
4380A>reference external

Query:
4380A>settings reference:source
external

Warning: Prior to setting the reference to external, make sure the 10MHz signal from the external reference is plugged in to the 10MHz IN connector on the rear of the 4380A and the system is locked to that reference.

```
4380A_60>status reference:frequency:external:signal
present
[OK] 2013-09-04T17:27:18Z

4380A_60>status reference:frequency:external:locked
true
[OK] 2013-09-04T17:27:18Z
```

2.51 reference_type

Description: Select type of frequency reference. If an external frequency reference (e.g., cesium, MASER) is available that is more stable than the internal reference then the timing performance can be enhanced by utilizing the external source as the frequency reference for the system. In order to fully realize the performance benefit the system must be told what type of reference is being provided to it.

The system supports both monitored and unmonitored use of an external frequency reference. If the external source is to be monitored by the system then the reference type (given by *settings reference:external:type*) specified will be a model number such as 'hp5071a'. This enables the system to know how to communicate with the device and allows it to query status information from the reference and monitor it for any reported failures. In instances where monitoring is either not available or not desired then the reference type specified will be a generic class of oscillator such as 'cesium' or 'maser'. This enables the system to utilize the external frequency reference but does not perform any sort of remote monitoring of the reference. Thus, failures of the external reference will not trigger an alarm on the system unless the failure is catastrophic enough to trigger another failure mechanism within the system.

See also: reference

Usage: reference_type <cesium|hp5071a|maser>

Command Example:

```
4380A>reference_type hp5071a
```

Query:

```
4380A>settings reference:external:type  
hp5071a
```

2.52 remote_ntp_offset

Description: Returns the offset in seconds between Sync System time and that of an external NTP server.

Usage: remote_ntp_offset <NTP server>

Example:

```
4380A>remote_ntp_offset 192.168.150.61  
Offset to NTP server "192.168.150.61": -0.000409 seconds.  
[OK] 2013-09-04T16:02:27Z
```

If users attempt to obtain the offset of a nonexistent or NTP Server that may be down the system reports the following:

```
4380A>remote_ntp_offset 192.168.150.63  
The NTP server "192.168.150.63" is not accessible.  
[ERROR] 2013-09-04T16:04:04Z
```

2.53 restart

Description: Restart this application. By default the system will perform a warm restart in which the outputs of the system and current settings will be preserved during the restart process. Specifying a cold restart will reset the system settings to their saved values and perform a complete reset of the hardware which will result in a loss of output signals.

Usage: restart [--cold]

Command Example:

```
4380A>restart
```

2.54 save

Description: Save system configuration settings to file. The save command saves the current settings variables. This is useful in creating multiple system configurations for easy reloading and for ensuring the instrument preserves the same settings after a power cycle. The settings files are physically stored to the flash drive so they will be lost if the flash is replaced but are preserved if a software update is performed.

By default the save command stores the entire settings tree to the file named "default". This is the settings file that is loaded at startup so it defines the settings that the system will be initialized with. Other configurations can be stored by specifying a unique filename.

A subset of the configuration settings can also be saved. This enables users to save a portion of the settings variables and load them later without affecting all the settings variables for the system. For instance, a user may use *save location1 gnss:positioning:manual_position* to store only the GNSS antenna location so that multiple known antenna locations can be saved and then recalled later using the load command.

See Also: load, list, show, settings

Usage: save [FILENAME] [NODE]
FILENAME Name of settings file ('default' if unspecified)
NODE Node subset to save

Command Example:
4380A>save test

Query:
4380A>list
default
test

2.55 save_logs

Description: Saves the current GNSS logging settings to the specified file. If no file is specified then it saves the settings to the file named "default". The save_logs command supports saving either all of the GNSS logging configuration parameters or only a specific subset of the settings. For instance, if only the list of FTP logs themselves is desired then a user could type *save_logs ftp user_filename log_selection* to save only the list of the GNSS logs requested for FTP logging.

Multiple GNSS logs can be requested from the system and the ability to load a saved set of GNSS logs is useful for quickly switching between different configurations or transferring a specific logging configuration from one system to another without affecting other system settings.

See also: list_logs, delete_logs, log, unlog, save, delete, list

Usage: save_logs <ftplrt> [FILENAME]
FILE file to save

Command Example:
4380A>save_logs ftp test

Query:
4380A>list_logs ftp
default
test

2.56 settings

Description: Show unit settings. The settings command displays all the settings variables for the system. Settings variables are values that are settable by the user. They are not automatically saved however so the user must use the save command in order to preserve the settings across a power cycle. Also note that they represent the settings of the instrument and not necessarily the current state of the instrument. This command is equivalent to the *show settings* command and the settings variables also appear on the status port (port 1900).

A specific subset of the settings variables can be requested by specifying the specific node within the hierarchy that is desired. For instance, *settings gnss* displays the current GNSS status for the system.

See Also: show, status, network, config, save, load

Usage: settings [-d MAX_DEPTH] [NODE]

MAX_DEPTH limit display to MAX_DEPTH levels of data

NODE specifies a node to display

Command Example:

```
4380A>settings
```

2.57 show

Description: The show command displays all the application variables that are available for a user to view. These are the same variables that are output on the status port (port 1900) except that they are displayed in a hierarchical view instead of a list view. The status port is typically the preferred method for retrieving the current state of the variables in an automated manner because it displays a complete list of the variables when the connection is established and then only outputs values when they change.

There are 4 types of application variables and each has its own behavior:

- **config:** Config variables are values that are set at the factory and are not modifiable by the user. They are stored on the hardware itself so replacing the flash will not affect their value. They contain information such as the product part number, serial number, and information specific to the hardware itself.
- **network:** Network variables are values that specifically pertain to the network settings of the instrument. They are settable by the user and automatically saved when they are changed. They are physically stored on the flash drive so changing the flash will cause you to lose your network settings. They are however preserved during a software update.
- **settings:** Settings variables are values that are settable by the user. They are not automatically saved however so the user must use the save command in order to preserve the settings across a power cycle. Also note that they represent the settings of the instrument and not necessarily the current state of the instrument.
- **status:** Status variable are values that indicate the current state of the instrument. They are not settable by the user and cannot be saved.

The show command can be used to view only a portion of the tree by requesting the specific node within the hierarchy that you would like to view. For instance, *show settings:gnss* displays the current GNSS settings for the instrument and *show status:gnss* displays the current GNSS status for the system.

See Also: status, settings, network, config, save, load

Usage: show [--debug | [<-d | --depth> MAX_DEPTH]] [NODE]
MAX_DEPTH limit display to MAX_DEPTH levels of data
(not available with the --debug option)
NODE specifies a node to display

Command Example:
4380A>show

2.58 software_update

Description: Execute software update. The software can be upgraded remotely using this command. The Sync System-*.iso image must be obtained from the Microsemi ftp site ftp.timing.com/pub/4380A. Use binary transfer mode for all file transfers. Upload the image to the unit using ftp with username and password 'update'. Software release notes for each version are also available in the same directory on the ftp site.

After successful completion of the software update, the unit will reboot, system settings will be reset to their saved values, and hardware will undergo a complete reset, resulting in the loss of output signals.

Usage: software_update <--ftp | --usb> [--file FILENAME] [--list]

- ftp The updater searches for an ISO file in the upload directory. To upload an ISO file use FTP with username and password 'update'.
- usb The updater searches for an ISO file on a USB drive. Not all units support connecting a USB drive.
- file ISO file name, needed only if more than one ISO file is found.
- list List available ISO files (list only; does not apply any update).

Command Example:
4380A>software_update Sync System-5-1-0.iso

Note: If the iso image is not on the system the command will attempt to execute, display a line feed and the system will return to the command prompt. If this occurs the iso file must be uploaded to the system before the software can be updated.

2.59 status

Description: Show unit status. The status command displays all the status variables for the system. Status variables provide the current state of the system and are not modifiable by the user nor can they be saved. This command is the equivalent to the *show status* command and the status variables also appear on the status port (port 1900).

A specific subset of the status variables can be requested by specifying the specific node within the hierarchy that is desired. For instance, *status gnss* displays the current GNSS status for the system.

See Also: show, settings, network, config, save, load

Usage: status [-d MAX_DEPTH] [NODE]
MAX_DEPTH limit display to MAX_DEPTH levels of data
NODE specifies a node to display

Command Example:
4380A>status

2.60 *status_port*

Description: Switch to the status port. Changes the current command port (1700) connection into a status port (1900) connection. Hitting the <return> key will switch the connection back into a command port connection.

The status port (1900) outputs information about the current state of variables within the system. When the connection is first established the system will output the current state of all the variables but then will only output changes to the variables from that point on. This is useful in creating a graphical interface to display only the information you want and is useful in monitoring key aspects of the system.

The status port is intended primarily for automated consumption by another system but is displayed in ASCII format to make it human-readable. Each line of output is given in the following format:

<TIMESTAMP> <KEY>=<VALUE>

TIMESTAMP is the system time that the variable was set to that value and does not represent the current time of the system. KEY is the name of the system variable. VALUE is the current value of that system variable.

The variables are organized into a hierarchy that groups related variables together. This enables displaying only the subset of variables that a user may be interested in by specifying the desired node within the hierarchy. For instance, *status_port status:gnss* will display only the GNSS status variables instead of all the variable.

See also: *diag_port*, *ptdraw_port*, *ptdavg_port*, *show*

Usage: *status_port* [NODE]
NODE node to display

hit <return> to switch back to command port

Command Example:
4380A>*status_port*

2.61 *steer_frequency*

Description: Manually change the frequency of the instrument's outputs when the steer source is Manual.

Usage: *steer_frequency* <fractional frequency> | nominal
steer_frequency nominal

- *steer_frequency* <fractional frequency> - offset relative to current frequency.
- *steer_frequency* nominal - set frequency to 10 MHz.

2.62 *steer_phase*

Description: Manually change the phase of the instrument's outputs when the steer source is Manual. Steers to the specified phase offset over a 10 second period. The time parameter must be within +/- 10 nanoseconds

Usage: *steer_phase* <+/- 10e-9 seconds>
steer_phase -1e-8

2.63 syscfg

Description: Syscfg allows the user to specify expected status, settings, and/or config. If a discrepancy is detected between an expected value and an actual value, the syscfg alarm will be raised. You may also examine *status syscfg:errors* for a complete list of syscfg discrepancies.

OPTIONS:

- `mode <standalone | system>` In system mode, the unit will alarm for system configuration discrepancies. In standalone mode, it will not.
- `restore` - Restore the default system configuration.
- `reload` - Force a reload of current system configuration.
- `import <file name | ->` Import a new configuration. 'file name' should be the name of the configuration file uploaded to the unit through FTP. Alternatively, specifying '-' as the file name will cause the configuration file to be read from stdin until a line containing only 'eof' is read. The following line must contain the md5 checksum of the configuration.
- `export <file name | ->` Export the current configuration to 'file name'. The exported file will be accessible through FTP. Alternatively, specifying '-' will dump the current configuration to stdout, terminated with a line containing only 'eof', followed by the md5 checksum of the configuration.

The unit is shipped with an example syscfg configuration. To customize the configuration for your site, you may use the export command, edit the plain text file, and then import the modified file. FTP access to syscfg is accomplished with the user 'update', password 'update'.

Default File: /mod/tsc/syscfg/localcfg.py

Usage: syscfg [--mode <standalone | system>] [--restore] [--reload] [--import <FILENAME | ->] [--export <FILENAME | ->]

--mode Set the mode for system configuration checking
--restore Restore the default system configuration
--reload Force a reload of current system configuration
--import Import a new configuration from FILENAME or stdin(-)
--export Export the current configuration to FILENAME or stdout (-)

Command Example:

4380A>syscfg -import FileName.py

2.64 syslog

Description: Dump the system log. System information pertaining to the underlying operation of the system and operating system is logged to aid in troubleshooting efforts. These logs can be retrieved via the status port using the *syslog* command. When a log becomes too large it is archived and a new log is started. The syslog command retrieves the current log but archived logs can be retrieved by specifying the desired log number. A maximum of 5 archived logs are stored with 0 being the most recent and 4 being the oldest.

Usage: syslog [GEN]

GEN archived log generation number (0-4)

Command Example:

4380A>syslog

2.65 unlog

Description: Remove a GNSS log. The unlog command removes a specific log from the requested list of GNSS logs. It can also be used to remove all the requested logs by issuing the "all" parameter instead of a specific log name.

FTP and realtime logs currently requested by the user can be viewed by typing *settings gnss_logging:ftp:log_selection* and *settings gnss_logging:rt:log_selection* respectively.

See also: log, log_enable, save_logs, list_logs, delete_logs

Usage: unlog <rt | ftp> <LOGA | all>
LOGA Name of requested GNSS log

Command Example:
4380A>unlog ftp waas9a waas9a = [type]

Query:
4380A>settings gnss_logging:ftp:log_selection
[bestposa] ontime 7200
[ionutca] ontime 7200
[rangea] ontime 60
[rawalma] onchanged
[rawephema] onchanged
[rxhwlevels] ontime 60

3. Network Variables

network:mode =[string] (dhcp, static)

- Method the system will use to get the IP Address.

network:static:broadcast =[string]

- The broadcast address used by the unit if mode = static.

network:static:default_gateway =[string]

- The default router address used by the unit if mode = static.

network:static:ip =[string]

- The IP address used by the unit if mode = static.

network:static:netmask =[string]

- The subnet mask address used by the unit if mode = static.

4. Status Variables

Status variables represent a class of variables that are not directly modifiable by the user. They represent the current operational state of the SyncSystem and their value depends upon the state of multiple user settings. Because these variables are not settable by the user they are not saved if the user executes the *save* command will not persist across a power cycle. The status variable values will vary based on user settings and the variable types may also vary between units based on the installed options in each system.

4.1 GNSS

status:gps:auto_positioning:time_remaining=[string]

- Countdown time until auto survey is complete and RINEX file is available.
- Only present when position_mode = auto

status:gnss:mode:desc=[string] (unknown, fault, missing, not tracking, tracking, cannot communicate)

- Description of the GNSS receiver tracking status.
 - o Unknown – Receiver state is unknown
 - o Fault – Receiver is not currently working
 - o Missing – Unable to detect the Receiver.
 - o Not Tracking – Receiver is working and is not tracking
 - o Tracking – Receiver is working and is tracking
 - o Cannot Communicate – 4380A is unable to communicate with the internal receiver.

status:gnss:mode:value=[integer] (0-5)

- 0 = unknown
- 1 = fault
- 2 = missing
- 3 = not tracking
- 4 = tracking
- 5 = cannot communicate

status:gnss:model:hw_version=[string]

- Hardware version of the GNSS receiver installed.

status:gnss:model:name=[string]

- Model Name of the GNSS receiver installed.

status:gnss:model:serial_number=[string]

- Serial # of the GNSS receiver installed.

status:gnss:model:sw_version=[string]

- Software/firmware version running on the GNSS receiver.

status:gnss:position:alt=[double]

- Altitude as reported by the GNSS Receiver in meters.

status:gnss:position:fixed=[bool]

- True – Receiver has completed the auto survey and fixed the position (auto) or the receiver is in the manual position mode
- False - Receiver has not completed the auto survey and fixed the position (auto) or the receiver is in the dynamic position mode

status:gnss:position:lat=[double]

- Latitude as reported by the GNSS receiver in degrees.

status:gnss:position:lon=[double]

- Longitude as reported by the GNSS receiver in degrees.

status:gnss:satellite:number=[integer]

- # of SVs currently being tracked by the GNSS Receiver.

status:gnss:satellite:signal:avg=[float]

- Current average C/No value reported by the GNSS Receiver.

status:gnss:satellite:signal:desc=[string]

- Poor – C/No values are low, could cause performance issues
- Fair – C/No values are acceptable
- Good – C/No values are within their normal operating range.

status:gnss:satellite:signal:enum=[integer]

- 0 – C/No values are low, could cause performance issues
- 1 – C/No values are acceptable
- 2 – C/No values are within their normal operating range.

status:gnss:satellite:signal:freq=[string] (single | dual)

- Single – L1 Only
- Dual – L1 and L2 carrier Phase

status:gnss:satellite:signal:max=[float]

- Maximum C/No value reported by the GNSS Receiver.

status:gnss:satellite:signal:min=[float]

- Minimum C/No value reported by the GNSS Receiver.

4.2 Hardware

status:hardware:fan:N=[bool] (N=Fan #)

- True – fan is operating normally
- False – System has detected a fan failure

status:hardware:mainboard:euid=[string]

- Electronic Unit Identifier string for the unit

status:hardware:mainboard:serialnum=[string]

- Serial # of the system main board.

status:hardware:mainboard:type=[string]

- Board ID information

4.3 Hardware:Outputs

status:hardware:outputs:enabled=[bool]

- True – Outputs are enabled
- False – Outputs are disabled

status:hardware:outputs:slots:X:ports:Y:status=[string] (disabled, bad, good) (X=Slot #, Y=Port #)

- Disabled – Outputs are disabled
- Bad – Outputs are enabled and port is reporting output failure
- Good – Outputs are enabled and port is reporting the output is within the proper levels.

status:hardware:outputs:slots:X:power=[string] (disabled, enabled, bad, insufficient, error, unknown) (X=Slot #)

- disabled = hardware is ok, configured to be disabled.

- enabled = hardware is ok and working properly
- bad -= hardware is enabled but has an issue (i.e. Port has failed)
- insufficient = hardware should be enabled, but there is a power issue and the card is disabled.
- error = hardware initialization error

status:hardware:outputs:slots:X:type=[string] (X=Slot #)

- Model # of the card installed in Slot X.

status:hardware:outputs:warmstartable=[bool]

- True – Unit has enough clock data to allow a warmstart
- False – Unit does not have sufficient data to performance a warmstart.

status:hardware:power:numsupplies=[integer] (1 or 2)

- 1 – One of the two power supplies is operating normally
- 2 – Both power supplies are operating normally.

status:hardware:power:supplies:N:status=[string] (failing, good)

- Failing –Power supplies is not operating normally or has failed.
- Good –Power supply is operating normally.

status:hardware:power:supplies:N:type=[string]

- 4385X – AC Power Supply (X=Revision)
- 4386X – DC Power Supply (X=Revision)

status:hardware:temperature=[integer]

- Internal temperature of the system in C°

4.4 Health

Each subsystem and major component of the 4380A is monitored and as alarms occur they are reported in the health portion of the status tree (*status health*). When an alarm occurs the system will indicate the time (when) the alarm was set along with an alarm description(what). The alarm occurrence counter will increment by one. Some alarms clear automatically and when they do clear the system will indicate the time (when) the alarm cleared and what alarm condition cleared (what). If the alarm latches, the clear alarm indications will not be set until the user send the *clear_alarms* command.

status:alarm=[string] (no alarm or alarm string)

- System alarm string, otherwise “no alarm”

status:health:alarm_condition:active=[integer]

- System is reporting and active alarm for the subsystem

status:health:alarm_condition:cleared:what=[string]

- String for the subsystem error that cleared

status:health:alarm_condition:cleared:when=[integer]

- Date and Time the sub system error cleared.

status:health:alarm_condition:occurrences=[integer]

- The # of times the subsystem has reported an error

status:health:alarm_condition:set:what=[string]

- Alarm string for the subsystem reporting the error.

status:health:alarm_condition:set:when=[integer]

- Date and time the error occurred.

EXAMPLE

```
[clock_wander]
[active] false
[cleared]
  [what] Clock wander is less than 100.000000ns
  [when] 2009-01-26-22:18:48.141
[occurrences] 1
[set]
  [what] Clock wander exceeded 100.000000ns
  [when] 2009-01-26-22:18:35.922
```

4.5 Alarm Conditions

- Clock Frequency Step:
- Clock Phase Step:
- Clock Starvation:
- Clock Steer:
- Clock Wander:
- Fans
- Firmware Version Mismatch
- GNSS Communications Error
- GNSS Error
- GNSS Invalid Fix
- GNSS Tracking
- Hardware Internal
- 5071A EMult Voltage
- 5071A Locked
- 5071A Oscillator Control
- 5071A Signal Gain
- 5071A EMult Voltage
- Measurement Starvation
- Missing Calibration
- Leap Seconds Internal Error
- Leap Seconds Unknown
- OCXO Frequency Control
- Outputs Disabled
- Over Temperature
- Power Supply
- Reference Communications Errors
- Reference Missing
- Reference Unlocked
- System Time Of Day Invalid
- Sysconfig
- TCXO Failure

status:alarm=[string]

- No alarm – There are NO alarms on the unit
- String – Alarm event set, text of the most critical alarm presented here.

4.6 Output Module Alarms

Alarms and events on the 4380A output modules are available via the *status health:output_modules* command. As with the other alarms as events occur the system will *set* the alarm and time. Once the condition clears the system will indicate the condition *cleared*, what the condition was, when it cleared and increment the occurrence counter.

Card:

N = Slot #

status:health:output_modules:N:active=[bool]

- True – Summary alarm for the card in slot N is reporting there are one or more issues.
- False – Card in slot N is not reporting any alarms.

status:health:output_modules:N:occurrences=[integer]

- True – # of total alarms reported on the card in slot N.

Ports:

X=Slot #

Y = Port #

status:health:output_modules:X:ports:Y:cleared:what=[string]

- String for the port error that cleared

status:health:output_modules:X:ports:Y:cleared:when=[integer]

- Date and Time the port error cleared.

status:health:output_modules:X:ports:Y:occurrences=[integer]

- The # of times the port has reported an error

status:health:output_modules:X:ports:Y:set:what=[string]

- Alarm string for the port reporting the error.

status:health:output_modules:X:ports:Y:set:when=[integer]

- Date and time the port error occurred.

4.7 KAS2

status:kas2:aging=[double]

- Estimate of the aging state of the frequency reference clock, in units of s/s^2 . Aging is the derivative of frequency.

status:kas2:coldstart_time=[string]

- Date and time the last cold start occurred.

status:kas2:frequency=[double]

- Estimate of the frequency error in the outputs, in units of s/s. Frequency is the derivative of phase.

status:kas2:phase=[double]

- Estimate of the phase error in the outputs, with respect to the steer source, in units of seconds.

status:kas2:ptd=[double]

- Instantaneous measurement of the phase error in the outputs, with respect to the steer source, in units of seconds

status:kas2:steer=[double]

- The frequency steer currently applied for the purpose of locking the outputs to the steer source, in units of s/s.

status:kas2:warmstart_time=[string]

- Date and time the last warm start occurred.

4.8 Leapseconds

status:leapseconds:current=[integer]

- Number of leap seconds the system is adjusting for.

status:leapseconds:effectivity_time=[string]

- Date and time the leap second is effective till

status:leapseconds:future=[integer]

- Number of leap seconds that will be in effect after the next effectivity date.

4.9 Outputs:enabled

status:outputs:enabled=[bool]

- True – System outputs have been enabled
- False – System outputs are disabled

4.10 Reference

status:reference:frequency:external:communications=[string] (good,bad, na)

- good – System is able to communicate with the external reference
- bad – System is unable to communicate with the external reference
- na – The reference is not being monitored (reference_type ≠ hp5071a)

status:reference:frequency:external:locked=[bool]

- true – System is locked to the external reference
- false – System is not locked to the external reference

status:reference:frequency:external:signal=[string] (present | missing)

- present – External reference signal has been detected
- missing – external signal is not available or connected.

status:reference:hp5071:can_communicate=[bool]

- true – System is able to communicate with the external 5071A
- false – System is unable to communicate with the external 5071A

status:reference:hp5071:electron_multiplier_voltage=[double]

- EMult as reported by the 5071A the unit is communicating with

status:reference:hp5071:osc_freq_control=[double]

- Oscillator Frequency Control as reported by the 5071A the unit is communicating with

status:reference:hp5071:Power=[string] (AC or DC)

- AC- 5071 is connected to and operating from an AC Power Source
- DC- 5071 is connected to and operating from an DC Power Source

status:reference:hp5071:serial_number=[string]

- Serial # of the 5071 Cesium Beat Tube (CBT)

status:reference:hp5071:signal_gain=[double]

- Signal Gain as reported by the 5071A the unit is communicating with

status:reference:lns:locked=[bool]

- true – System's LNS is locked.
- false – System's LNS is not locked

status:reference:ntp:locked=[bool]

- true – System is locked to the internal NTP Server.
- false – System is not locked to the NTP Server

status:reference:ntp:source=[string]

- Time of Day source (NTP)

status:reference:oxco_freq_control=[integer] (-98 to 98)

- Control value reported by the OCXO.

4.11 TIC Card Measurements

The measurements are only available when the 4393A TIC Card is installed in one or more slots.

status:tic_measurements:channel:XY=[double]

- Average measurement in seconds the TIC is reporting. These measurements report the internal clock against the external PPS input(s). X – Slot #, Y = Port #.

Example:

[tic_measurements]	Counter
[channel]	Channel data [slot port]
	Average measurement result
[31] 6.458333333000000e-09	
[32] 7.604166667000000e-09	
[33] 1.306122449000000e-08	
[34] 7.553191489000000e-09	

4.12 Time

status:time=[string]

- Current date and time of the system when this report was made.

4.13 Unit

status:unit:network:MAC=[string]

- MAC Address of the unit

status:unit:network:broadcast=[string]

- Broadcast address of the unit as assigned by a dhcp server or statically

status:unit:network:default_gateway=[string]

- Gateway address of the unit as assigned by a dhcp server or statically

status:unit:network:ip=[string]

- IP address of the unit as assigned by a dhcp server or statically

status:unit:network:netmask=[string]

- Subnet mask address of the unit as assigned by a dhcp server or statically

status:unit:serial_number=[string]

- 4380A Serial #.

status:unit:start=[string]

- Date and time the kas2 filter started.

status:unit:uptime=[string]

- Duration the unit has been operating

status:unit:ver=[string]

- Current software version running on the system.

5. Status Port (1900)

Each of these section provides details on the information the SyncSystem provides on the Status Port (Port 1900). User can connect directly to this port and the data will come out as:

- Date/Time Stamp or boot+ N Secs: Actual System Time, if time is unknown the boot+ indicates the # of seconds from the time the system booted.
- The field the system is reporting on
- The current value the system is using (settings) or the value the system is reporting (status).

Note: The settings are the current settings the system is using, these are not the saved values unless the operator has used the *save* command.

Port 1900 allows the operator to obtain all of the system **network/settings/config/status** parameters each time they connect to the status port. When the operator connects to the port the system will dump all of these the parameters. Once this data dump is complete the system will only forward data from this port is the data that has changed since the system has been running. This data will be preceded by the date and time of the event as this information is updated. It is important to recognize these parameters are also reflected in the results from the status command.

5.1 Network

```
2015-09-14-22:17:48.947 network:mode=dhcp
2015-09-14-22:17:48.947 network:static:broadcast=192.168.0.255
2015-09-14-22:17:48.948 network:static:default_gateway=192.168.0.254
2015-09-14-22:17:48.948 network:static:ip=192.168.0.1
2015-09-14-22:17:48.948 network:static:netmask=255.255.255.0
```

Note: If the system time is not set it will show boot + N seconds.

```
boot+158sec network:netmask=255.255.255.0
```

If the system time is set (i.e. warmstart) the system will report the actual time the value was set.

```
2015-08-08-15:34:09.888 network:mode=static
2015-08-08-15:34:09.894 network:static:broadcast=192.168.150.255
2015-08-08-15:34:09.900 network:static:default_gateway=192.168.150.1
2015-08-08-15:34:09.906 network:static:ip=192.168.150.60
2015-08-08-15:34:09.912 network:static:netmask=255.255.255.0
```

Note: These are the user network settings, if the network:mode = dhcp the actual network settings for the unit must be obtained using the *status unit:network* command.

```
4380A>status unit:network
```

```
[MAC] 00:30:96:00:01:02
[broadcast] 192.168.150.255
[default_gateway] 192.168.150.1
[ip] 192.168.150.60
[netmask] 255.255.255.0
[OK] 2015-08-08T15:34:57Z
```

5.2 Settings

If the system time is not set it will show boot + N seconds.

```
2015-09-14-22:17:48.963 settings:command_port:prompt:enable=true
2015-09-14-22:17:48.963 settings:command_port:prompt:text=4380A
2015-09-14-22:17:48.963 settings:diaglog:app=info
2015-09-14-22:17:48.964 settings:diaglog:clock=info
2015-09-14-22:17:48.964 settings:diaglog:devices=info
2015-09-14-22:17:48.964 settings:diaglog:gps=info
2015-09-14-22:17:48.964 settings:diaglog:hardware=info
2015-09-14-22:17:48.964 settings:diaglog:kas2=info
2015-09-14-22:17:48.964 settings:diaglog:ntp=info
2015-09-14-22:17:48.964 settings:diaglog:software=info
2015-09-14-22:17:48.964 settings:diaglog:switching=info
2015-09-14-22:17:48.964 settings:diaglog:tic=info
2015-09-14-22:17:48.964 settings:gps:antenna_delay=0.0000000000000000e+00
2015-09-14-22:17:48.990 settings:gps:antenna_voltage=1.2000000000000000e+01
```


2015-09-14-22:17:48.964 settings:gps:datum=wgs84
2015-09-14-22:17:48.965 settings:gps:mask_angle=1.000000000000000e+01
2015-09-14-22:17:48.965 settings:gps:positioning:auto_hours=1.200000000000000e+01
2015-09-14-22:17:48.965 settings:gps:positioning>manual_position:altitude=1.592729000000000e+03
2015-09-14-22:17:48.965 settings:gps:positioning>manual_position:latitude=4.00194142277778e+01
2015-09-14-22:17:48.990 settings:gps:positioning>manual_position:longitude=-1.05239096244444e+02
2015-09-14-22:17:48.965 settings:gps:positioning:mode=dynamic
2015-09-14-22:17:48.965 settings:gps:tracking_timeout=2.880000000000000e+04
2015-09-14-22:17:48.965 settings:gps_logging:ftp:compression=true
2015-09-14-22:17:48.965 settings:gps_logging:ftp:enable=true
2015-09-14-22:17:48.966 settings:gps_logging:ftp:file_count=1.000000000000000e+02
2015-09-14-22:17:48.966 settings:gps_logging:ftp:filename:digits=3.000000000000000e+00
2015-09-14-22:17:48.966 settings:gps_logging:ftp:filename:prefix=user
2015-09-14-22:17:48.966 settings:gps_logging:ftp:filename:suffix=nov
2015-09-14-22:17:48.966 settings:gps_logging:ftp:filename:type=timestamp
2015-09-14-22:17:48.966 settings:gps_logging:ftp:interval=1.500000000000000e+01
2015-09-14-22:17:48.966 settings:gps_logging:ftp:log_selection:bestposa=ontime 7200
2015-09-14-22:17:48.966 settings:gps_logging:ftp:log_selection:ionutca=ontime 7200
2015-09-14-22:17:48.966 settings:gps_logging:ftp:log_selection:rangea=ontime 60
2015-09-14-22:17:48.966 settings:gps_logging:ftp:log_selection:rawalma=onchanged
2015-09-14-22:17:48.967 settings:gps_logging:ftp:log_selection:rawephema=onchanged
2015-09-14-22:17:48.967 settings:gps_logging:ftp:log_selection:rxhwlevels=ontime 60
2015-09-14-22:17:48.967 settings:gps_logging:ftp:log_selection:waas9a=onchanged
2015-09-14-22:17:48.967 settings:gps_logging:rt:enable=true
2015-09-14-22:17:48.967 settings:gps_logging:rt:log_selection:gpggark=ontime 1
2015-09-14-22:17:48.967 settings:hardware:enable_fp_button=true
2015-09-14-22:17:48.991 settings:hardware:slots:1:tsc4394:ports:1:pps_period=1.000000000000000e+00
2015-09-14-22:17:48.991 settings:hardware:slots:1:tsc4394:ports:1:pps_width=1.000000000000000e-04
2015-09-14-22:17:48.991 settings:hardware:slots:1:tsc4394:ports:1:type=pps
2015-09-14-22:17:48.991 settings:hardware:slots:1:tsc4394:ports:2:pps_period=1.000000000000000e+00
2015-09-14-22:17:48.992 settings:hardware:slots:1:tsc4394:ports:2:pps_width=1.000000000000000e-04
2015-09-14-22:17:48.992 settings:hardware:slots:1:tsc4394:ports:2:type=pps
2015-09-14-22:17:48.992 settings:hardware:slots:1:tsc4394:ports:3:format=B
2015-09-14-22:17:48.992 settings:hardware:slots:1:tsc4394:ports:3:sigal_word=0
2015-09-14-22:17:48.992 settings:hardware:slots:1:tsc4394:ports:3:type=irig
2015-09-14-22:17:48.992 settings:hardware:slots:1:tsc4394:ports:4:format=B
2015-09-14-22:17:48.992 settings:hardware:slots:1:tsc4394:ports:4:sigal_word=0
2015-09-14-22:17:48.993 settings:hardware:slots:1:tsc4394:ports:4:type=irig
2015-09-14-22:17:48.993 settings:hardware:slots:2:tsc4394:ports:1:pps_period=1.000000000000000e+00
2015-09-14-22:17:48.993 settings:hardware:slots:2:tsc4394:ports:1:pps_width=1.000000000000000e-04
2015-09-14-22:17:48.993 settings:hardware:slots:2:tsc4394:ports:1:type=pps
2015-09-14-22:17:48.993 settings:hardware:slots:2:tsc4394:ports:2:pps_period=1.000000000000000e+00
2015-09-14-22:17:48.993 settings:hardware:slots:2:tsc4394:ports:2:pps_width=1.000000000000000e-04
2015-09-14-22:17:48.994 settings:hardware:slots:2:tsc4394:ports:2:type=pps
2015-09-14-22:17:48.994 settings:hardware:slots:2:tsc4394:ports:3:format=B
2015-09-14-22:17:48.994 settings:hardware:slots:2:tsc4394:ports:3:sigal_word=0
2015-09-14-22:17:48.994 settings:hardware:slots:2:tsc4394:ports:3:type=irig
2015-09-14-22:17:48.994 settings:hardware:slots:2:tsc4394:ports:4:format=B
2015-09-14-22:17:48.994 settings:hardware:slots:2:tsc4394:ports:4:sigal_word=0
2015-09-14-22:17:48.995 settings:hardware:slots:2:tsc4394:ports:4:type=irig
2015-09-14-22:17:48.995 settings:hardware:slots:3:tsc4387:ports:1:epoch_127=false
2015-09-14-22:17:48.995 settings:hardware:slots:3:tsc4387:ports:1:format=B
2015-09-14-22:17:48.995 settings:hardware:slots:3:tsc4387:ports:1:sigal_word=120
2015-09-14-22:17:48.995 settings:hardware:slots:3:tsc4387:ports:1:type=irig
2015-09-14-22:17:48.995 settings:hardware:slots:3:tsc4387:ports:2:epoch_127=false
2015-09-14-22:17:48.996 settings:hardware:slots:3:tsc4387:ports:2:format=B
2015-09-14-22:17:48.996 settings:hardware:slots:3:tsc4387:ports:2:sigal_word=120
2015-09-14-22:17:48.996 settings:hardware:slots:3:tsc4387:ports:2:type=irig
2015-09-14-22:17:48.996 settings:hardware:slots:3:tsc4387:ports:3:epoch_127=false
2015-09-14-22:17:48.996 settings:hardware:slots:3:tsc4387:ports:3:format=B
2015-09-14-22:17:48.996 settings:hardware:slots:3:tsc4387:ports:3:sigal_word=120
2015-09-14-22:17:48.996 settings:hardware:slots:3:tsc4387:ports:3:type=irig
2015-09-14-22:17:48.997 settings:hardware:slots:3:tsc4387:ports:4:epoch_127=false
2015-09-14-22:17:48.997 settings:hardware:slots:3:tsc4387:ports:4:format=B
2015-09-14-22:17:48.997 settings:hardware:slots:3:tsc4387:ports:4:sigal_word=120
2015-09-14-22:17:48.997 settings:hardware:slots:3:tsc4387:ports:4:type=irig
2015-09-14-22:17:48.997 settings:hardware:slots:4:tsc4395:ports:1:enabled=true
2015-09-14-22:17:48.998 settings:hardware:slots:4:tsc4395:ports:2:enabled=true
2015-09-14-22:17:48.998 settings:hardware:slots:4:tsc4395:ports:3:enabled=true
2015-09-14-22:17:48.998 settings:hardware:slots:4:tsc4395:ports:4:enabled=true
2015-10-27-19:48:04.106 settings:hardware:slots:5:tsc4372at:ports:1:status_enabled=true
2015-10-27-19:48:04.106 settings:hardware:slots:5:tsc4372at:ports:2:status_enabled=true
2015-10-27-19:48:04.106 settings:hardware:slots:5:tsc4372at:ports:3:status_enabled=true
2015-10-27-19:48:04.106 settings:hardware:slots:5:tsc4372at:ports:4:status_enabled=true
2015-09-14-22:17:48.998 settings:hardware:slots:5:tsc4395:ports:1:enabled=true
2015-09-14-22:17:48.998 settings:hardware:slots:5:tsc4395:ports:2:enabled=true
2015-09-14-22:17:48.998 settings:hardware:slots:5:tsc4395:ports:3:enabled=true
2015-09-14-22:17:48.999 settings:hardware:slots:5:tsc4395:ports:4:enabled=true
2015-09-14-22:17:48.999 settings:hardware:slots:6:tsc4395:ports:1:enabled=true
2015-09-14-22:17:48.999 settings:hardware:slots:6:tsc4395:ports:2:enabled=true

2015-09-14-22:17:48.999 settings:hardware:slots:6:tsc4395:ports:3:enabled=true
2015-09-14-22:17:48.999 settings:hardware:slots:6:tsc4395:ports:4:enabled=true

5.3 Status

If the system time is not set it will show boot + N seconds.

2015-10-27-19:33:23.473 status:alarm=no alarm
2015-09-14-22:18:13.533 status:gps:auto_positioning:time_remaining=0 seconds
2015-09-14-22:19:03.129 status:gps:mode:desc=tracking
2015-09-14-22:19:03.129 status:gps:mode:value=4
2015-09-14-22:18:13.531 status:gps:model:hw_version=OEM628-2.01
2015-09-14-22:18:13.530 status:gps:model:name=G2SB0GTTN
2015-09-14-22:18:13.531 status:gps:model:serial_number=BFN15190136
2015-09-14-22:18:13.531 status:gps:model:sw_version=OEM060220RN0000
2015-10-27-21:13:53.775 status:gps:position:alt=1.5899620999999999e+03
2015-09-14-22:18:13.535 status:gps:position:fixed=false
2015-10-27-21:13:53.775 status:gps:position:lat=4.001942460856000e+01
2015-10-27-21:13:53.775 status:gps:position:lon=-1.052391113765201e+02
2015-10-27-21:13:13.605 status:gps:satellite:number=10
2015-10-27-21:13:53.775 status:gps:satellite:satellite:signal:avg=4.517540359497070e+01
2015-09-14-22:18:42.679 status:gps:satellite:signal:desc=Good
2015-09-14-22:18:42.679 status:gps:satellite:signal:enum=2
2015-09-14-22:18:52.699 status:gps:satellite:signal:freq=dual
2015-10-27-21:13:53.775 status:gps:satellite:signal:max=4.957400131225585e+01
2015-10-27-21:13:53.775 status:gps:satellite:signal:min=3.813000106811523e+01
2015-09-14-22:17:54.429 status:hardware:fan:1=true
2015-09-14-22:17:54.429 status:hardware:fan:2=true
2015-09-14-22:17:54.429 status:hardware:mainboard:EUID=11:22:33:44:55:66:77:88
2015-09-14-22:17:54.429 status:hardware:mainboard:serialnum=SYM35656
2015-09-14-22:17:54.429 status:hardware:mainboard:type=4380A-000
2015-10-27-19:33:22.511 status:hardware:outputs:enabled=true
2015-10-27-19:33:23.061 status:hardware:outputs:slots:1:ports:1:status=good
2015-10-27-19:33:23.061 status:hardware:outputs:slots:1:ports:2:status=good
2015-10-27-19:33:23.061 status:hardware:outputs:slots:1:ports:3:status=good
2015-10-27-19:33:23.062 status:hardware:outputs:slots:1:ports:4:status=good
2015-09-14-22:17:56.479 status:hardware:outputs:slots:1:power=enabled
2015-10-27-20:08:34.246 status:hardware:outputs:slots:1:type=4394A
2015-10-27-21:04:02.515 status:hardware:outputs:slots:2:ports:1:status=good
2015-10-27-21:04:02.515 status:hardware:outputs:slots:2:ports:2:status=good
2015-10-27-21:04:02.515 status:hardware:outputs:slots:2:ports:3:status=good
2015-10-27-21:04:02.515 status:hardware:outputs:slots:2:ports:4:status=good
2015-09-14-22:17:57.999 status:hardware:outputs:slots:2:power=enabled
2015-10-27-21:04:02.515 status:hardware:outputs:slots:2:type=4394A
2015-10-27-21:07:34.586 status:hardware:outputs:slots:3:ports:1:status=good
2015-10-27-21:07:34.586 status:hardware:outputs:slots:3:ports:2:status=good
2015-10-27-21:07:34.586 status:hardware:outputs:slots:3:ports:3:status=good
2015-10-27-21:07:34.586 status:hardware:outputs:slots:3:ports:4:status=good
2015-10-27-21:07:34.585 status:hardware:outputs:slots:3:power=enabled
2015-10-27-21:07:34.586 status:hardware:outputs:slots:3:type=4387A
2015-10-27-20:08:40.066 status:hardware:outputs:slots:4:ports:1:status=good
2015-10-27-20:08:40.066 status:hardware:outputs:slots:4:ports:2:status=good
2015-10-27-20:08:40.066 status:hardware:outputs:slots:4:ports:3:status=good
2015-10-27-20:08:40.066 status:hardware:outputs:slots:4:ports:4:status=good
2015-10-27-19:33:30.055 status:hardware:outputs:slots:4:power=enabled
2015-10-27-20:08:38.109 status:hardware:outputs:slots:4:type=4395B-1
2015-10-27-19:48:05.615 status:hardware:outputs:slots:5:ports:1:input_status:signal_detect=false
2015-10-27-19:48:05.615 status:hardware:outputs:slots:5:ports:1:input_status:tx_fault=false
2015-10-27-19:48:05.615 status:hardware:outputs:slots:5:ports:1:input_status:xcvr_present=true
2015-10-27-20:08:40.068 status:hardware:outputs:slots:5:ports:1:status=good
2015-10-27-19:48:05.616 status:hardware:outputs:slots:5:ports:2:input_status:signal_detect=false
2015-10-27-19:48:05.616 status:hardware:outputs:slots:5:ports:2:input_status:tx_fault=false
2015-10-27-19:48:05.616 status:hardware:outputs:slots:5:ports:2:input_status:xcvr_present=true
2015-10-27-20:08:40.068 status:hardware:outputs:slots:5:ports:2:status=good
2015-10-27-19:48:05.616 status:hardware:outputs:slots:5:ports:3:input_status:signal_detect=false
2015-10-27-19:48:05.616 status:hardware:outputs:slots:5:ports:3:input_status:tx_fault=false
2015-10-27-19:48:05.616 status:hardware:outputs:slots:5:ports:3:input_status:xcvr_present=true
2015-10-27-20:08:40.068 status:hardware:outputs:slots:5:ports:3:status=good
2015-10-27-19:48:05.617 status:hardware:outputs:slots:5:ports:4:input_status:signal_detect=false
2015-10-27-19:48:05.617 status:hardware:outputs:slots:5:ports:4:input_status:tx_fault=false
2015-10-27-19:48:05.617 status:hardware:outputs:slots:5:ports:4:input_status:xcvr_present=true
2015-10-27-20:08:40.068 status:hardware:outputs:slots:5:ports:4:status=good
2015-10-27-19:33:30.055 status:hardware:outputs:slots:5:power=enabled
2015-10-27-20:08:30.381 status:hardware:outputs:slots:5:type=4395B-10
2015-10-27-20:08:40.069 status:hardware:outputs:slots:6:ports:1:status=good
2015-10-27-20:08:40.069 status:hardware:outputs:slots:6:ports:2:status=good
2015-10-27-20:08:40.069 status:hardware:outputs:slots:6:ports:3:status=good
2015-10-27-20:08:40.069 status:hardware:outputs:slots:6:ports:4:status=good
2015-10-27-19:33:30.055 status:hardware:outputs:slots:6:power=enabled

2015-10-27-20:08:32.684 status:hardware:outputs:slots:6:type=4395B-5
2015-09-14-22:17:52.302 status:hardware:power:numsupplies=2
2015-09-14-22:18:04.577 status:hardware:power:supplies:1:status=good
2015-09-14-22:18:04.577 status:hardware:power:supplies:1:type=4386A
2015-09-14-22:18:05.092 status:hardware:power:supplies:2:status=good
2015-09-14-22:18:05.091 status:hardware:power:supplies:2:type=4385B
2015-10-27-21:13:57.478 status:hardware:temperature=46
2015-10-27-19:33:23.471 status:health:clock_freq_step:active=false
2015-10-27-19:33:23.471 status:health:clock_freq_step:occurrences=0
2015-10-27-19:33:23.471 status:health:clock_phase_step:active=false
2015-10-27-19:33:23.471 status:health:clock_phase_step:occurrences=0
2015-09-14-22:18:15.080 status:health:clock_starvation:active=false
2015-09-14-22:18:15.080 status:health:clock_starvation:occurrences=0
2015-10-27-19:33:23.471 status:health:clock_steer:active=false
2015-10-27-19:33:23.471 status:health:clock_steer:occurrences=0
2015-10-27-20:16:14.392 status:health:clock_wander:active=false
2015-09-14-22:19:05.388 status:health:clock_wander:cleared:what=Clock wander is less than 100.000000ns
2015-10-27-20:16:14.392 status:health:clock_wander:cleared:when=2015-10-27-20:16:14.391
2015-10-27-20:10:25.630 status:health:clock_wander:occurrences=2
2015-09-14-22:19:04.384 status:health:clock_wander:set:what=Clock wander exceeded 100.000000ns
2015-10-27-20:10:25.630 status:health:clock_wander:set:when=2015-10-27-20:10:25.629
2015-09-14-22:17:54.922 status:health:fan:1:active=false
2015-09-14-22:17:54.921 status:health:fan:1:occurrences=0
2015-09-14-22:17:54.922 status:health:fan:2:active=false
2015-09-14-22:17:54.922 status:health:fan:2:occurrences=0
2015-09-14-22:17:52.917 status:health:firmware_version_mismatch:active=false
2015-09-14-22:17:52.917 status:health:firmware_version_mismatch:occurrences=0
2015-09-14-22:18:04.977 status:health:gps_antenna_short:active=false
2015-09-14-22:18:04.976 status:health:gps_antenna_short:occurrences=0
2015-09-14-22:18:15.081 status:health:gps_communication_error:active=false
2015-09-14-22:18:15.081 status:health:gps_communication_error:occurrences=0
2015-09-14-22:18:14.070 status:health:gps_invalid_fixed_position:active=false
2015-09-14-22:18:14.070 status:health:gps_invalid_fixed_position:occurrences=0
2015-09-14-22:18:14.070 status:health:gps_tracking:active=false
2015-09-14-22:18:14.070 status:health:gps_tracking:occurrences=0
2015-09-14-22:18:04.977 status:health:hp5071:electron_multiplier_voltage:active=false
2015-09-14-22:18:04.977 status:health:hp5071:electron_multiplier_voltage:occurrences=0
2015-09-14-22:18:04.977 status:health:hp5071:locked:active=false
2015-09-14-22:18:04.977 status:health:hp5071:locked:occurrences=0
2015-09-14-22:18:04.977 status:health:hp5071:oscillator_control:active=false
2015-09-14-22:18:04.977 status:health:hp5071:oscillator_control:occurrences=0
2015-09-14-22:18:04.978 status:health:hp5071:signal_gain:active=false
2015-09-14-22:18:04.978 status:health:hp5071:signal_gain:occurrences=0
2015-09-14-22:18:15.081 status:health:measurement_starvation:active=false
2015-09-14-22:18:15.081 status:health:measurement_starvation:occurrences=0
2015-09-14-22:17:48.901 status:health:missing_calibration:active=false
2015-09-14-22:17:48.900 status:health:missing_calibration:occurrences=0
2015-09-14-22:17:54.922 status:health:ocxo_freq_control:active=false
2015-09-14-22:17:54.922 status:health:ocxo_freq_control:occurrences=0
2015-10-27-20:08:38.961 status:health:output_modules:1:active=false
2015-10-27-20:08:38.961 status:health:output_modules:1:occurrences=0
2015-10-27-20:08:38.962 status:health:output_modules:1:ports:1:active=false
2015-10-27-20:08:38.962 status:health:output_modules:1:ports:1:occurrences=0
2015-10-27-20:08:38.962 status:health:output_modules:1:ports:2:active=false
2015-10-27-20:08:38.962 status:health:output_modules:1:ports:2:occurrences=0
2015-10-27-20:08:38.962 status:health:output_modules:1:ports:3:active=false
2015-10-27-20:08:38.962 status:health:output_modules:1:ports:3:occurrences=0
2015-10-27-20:08:38.963 status:health:output_modules:1:ports:4:active=false
2015-10-27-20:08:38.963 status:health:output_modules:1:ports:4:occurrences=0
2015-10-27-21:04:03.002 status:health:output_modules:2:active=false
2015-10-27-21:04:03.001 status:health:output_modules:2:occurrences=0
2015-10-27-21:04:03.002 status:health:output_modules:2:ports:1:active=false
2015-10-27-21:04:03.002 status:health:output_modules:2:ports:1:occurrences=0
2015-10-27-21:04:03.002 status:health:output_modules:2:ports:2:active=false
2015-10-27-21:04:03.002 status:health:output_modules:2:ports:2:occurrences=0
2015-10-27-21:04:03.003 status:health:output_modules:2:ports:3:active=false
2015-10-27-21:04:03.002 status:health:output_modules:2:ports:3:occurrences=0
2015-10-27-21:04:03.003 status:health:output_modules:2:ports:4:active=false
2015-10-27-21:04:03.003 status:health:output_modules:2:ports:4:occurrences=0
2015-10-27-21:07:35.144 status:health:output_modules:3:active=false
2015-10-27-21:07:35.144 status:health:output_modules:3:occurrences=0
2015-10-27-21:07:35.145 status:health:output_modules:3:ports:1:active=false
2015-10-27-21:07:35.145 status:health:output_modules:3:ports:1:occurrences=0
2015-10-27-21:07:35.145 status:health:output_modules:3:ports:2:active=false
2015-10-27-21:07:35.145 status:health:output_modules:3:ports:2:occurrences=0
2015-10-27-21:07:35.145 status:health:output_modules:3:ports:3:active=false
2015-10-27-21:07:35.145 status:health:output_modules:3:ports:3:occurrences=0
2015-10-27-21:07:35.146 status:health:output_modules:3:ports:4:active=false
2015-10-27-21:07:35.146 status:health:output_modules:3:ports:4:occurrences=0
2015-10-27-20:08:38.965 status:health:output_modules:4:active=false

2015-10-27-20:08:38.965 status:health:output_modules:4:occurrences=0
2015-10-27-20:08:38.965 status:health:output_modules:4:ports:1:active=false
2015-10-27-20:08:38.965 status:health:output_modules:4:ports:1:occurrences=0
2015-10-27-20:08:38.965 status:health:output_modules:4:ports:2:active=false
2015-10-27-20:08:38.965 status:health:output_modules:4:ports:2:occurrences=0
2015-10-27-20:08:38.966 status:health:output_modules:4:ports:3:active=false
2015-10-27-20:08:38.965 status:health:output_modules:4:ports:3:occurrences=0
2015-10-27-20:08:38.966 status:health:output_modules:4:ports:4:active=false
2015-10-27-20:08:38.966 status:health:output_modules:4:ports:4:occurrences=0
2015-10-27-20:08:32.932 status:health:output_modules:5:active=false
2015-10-27-20:08:32.932 status:health:output_modules:5:occurrences=0
2015-10-27-20:08:32.933 status:health:output_modules:5:ports:1:active=false
2015-10-27-20:08:32.932 status:health:output_modules:5:ports:1:occurrences=0
2015-10-27-20:08:32.933 status:health:output_modules:5:ports:2:active=false
2015-10-27-20:08:32.933 status:health:output_modules:5:ports:2:occurrences=0
2015-10-27-20:08:32.933 status:health:output_modules:5:ports:3:active=false
2015-10-27-20:08:32.933 status:health:output_modules:5:ports:3:occurrences=0
2015-10-27-20:08:32.934 status:health:output_modules:5:ports:4:active=false
2015-10-27-20:08:32.933 status:health:output_modules:5:ports:4:occurrences=0
2015-10-27-20:08:32.934 status:health:output_modules:6:active=false
2015-10-27-20:08:32.934 status:health:output_modules:6:occurrences=0
2015-10-27-20:08:32.934 status:health:output_modules:6:ports:1:active=false
2015-10-27-20:08:32.934 status:health:output_modules:6:ports:1:occurrences=0
2015-10-27-20:08:32.935 status:health:output_modules:6:ports:2:active=false
2015-10-27-20:08:32.934 status:health:output_modules:6:ports:2:occurrences=0
2015-10-27-20:08:32.935 status:health:output_modules:6:ports:3:active=false
2015-10-27-20:08:32.935 status:health:output_modules:6:ports:3:occurrences=0
2015-10-27-20:08:32.935 status:health:output_modules:6:ports:4:active=false
2015-10-27-20:08:32.935 status:health:output_modules:6:ports:4:occurrences=0
2015-10-27-19:33:23.472 status:health:outputs_disabled:active=false
2015-10-27-19:33:23.472 status:health:outputs_disabled:cleared:what=Outputs are enabled
2015-10-27-19:33:23.472 status:health:outputs_disabled:cleared:when=2015-10-27-19:33:23.469
2015-09-14-22:17:54.922 status:health:outputs_disabled:occurrences=1
2015-09-14-22:17:54.923 status:health:outputs_disabled:set:what=Outputs are disabled
2015-09-14-22:17:54.923 status:health:outputs_disabled:set:when=2015-09-14-22:17:54.921
2015-09-14-22:17:54.923 status:health:over_temperature:active=false
2015-09-14-22:17:54.923 status:health:over_temperature:occurrences=0
2015-09-14-22:17:54.923 status:health:power_supply:1:active=false
2015-09-14-22:17:54.923 status:health:power_supply:1:occurrences=0
2015-09-14-22:17:54.924 status:health:power_supply:2:active=false
2015-09-14-22:17:54.923 status:health:power_supply:2:occurrences=0
2015-09-14-22:18:04.988 status:health:ref_comm_error:active=false
2015-09-14-22:18:04.988 status:health:ref_comm_error:occurrences=0
2015-09-14-22:18:05.994 status:health:ref_missing:active=false
2015-09-14-22:18:05.994 status:health:ref_missing:cleared:what=
2015-09-14-22:18:05.994 status:health:ref_missing:cleared:when=2015-09-14-22:18:05.992
2015-09-14-22:18:04.988 status:health:ref_missing:occurrences=1
2015-09-14-22:18:04.989 status:health:ref_missing:set:what=internal reference signal missing
2015-09-14-22:18:04.989 status:health:ref_missing:set:when=2015-09-14-22:18:04.975
2015-09-14-22:18:10.040 status:health:ref_unlocked:active=false
2015-09-14-22:18:10.040 status:health:ref_unlocked:cleared:what=LNS is locked
2015-09-14-22:18:10.040 status:health:ref_unlocked:cleared:when=2015-09-14-22:18:10.038
2015-09-14-22:18:07.033 status:health:ref_unlocked:occurrences=4
2015-09-14-22:18:07.033 status:health:ref_unlocked:set:what=LNS is unlocked
2015-09-14-22:18:07.033 status:health:ref_unlocked:set:when=2015-09-14-22:18:07.031
2015-09-14-22:18:04.990 status:health:station_time_of_day_invalid:active=false
2015-09-14-22:18:04.990 status:health:station_time_of_day_invalid:occurrences=0
2015-09-14-22:18:04.990 status:health:system_time_of_day_invalid:active=false
2015-09-14-22:18:04.990 status:health:system_time_of_day_invalid:occurrences=0
2015-09-14-22:17:54.924 status:health:txco_failure:active=false
2015-09-14-22:17:54.924 status:health:txco_failure:occurrences=0
2015-10-27-21:13:57.001 status:kas2:aging=2.597441674857212e-23
2015-10-27-19:33:23.542 status:kas2:coldstart_time=2015-10-27T19:33:23Z
2015-10-27-19:33:23.543 status:kas2:deviation_scalar=1.000000000000000e+00
2015-10-27-21:13:57.033 status:kas2:frequency=-1.879544279753506e-12
2015-10-27-21:13:57.033 status:kas2:phase=1.866413195821024e-08
2015-10-27-21:13:59.017 status:kas2:ptd=1.611988699699999e-08
2015-10-27-21:13:57.033 status:kas2:steer=-2.501904964447022e-12
2015-10-27-19:33:23.542 status:kas2:warmstart_time=N/A
2015-10-27-19:33:22.511 status:outputs.enabled=true
2015-09-14-22:18:04.375 status:reference:frequency:external:communications=bad
2015-09-14-22:18:04.375 status:reference:frequency:external:locked=false
2015-09-14-22:18:04.221 status:reference:frequency:external:signal=missing
2015-09-14-22:18:04.375 status:reference:frequency:internal:locked=true
2015-09-14-22:18:04.219 status:reference:hp5071:can_communicate=false
2015-09-14-22:18:09.639 status:reference:lns:locked=true
2015-10-27-19:33:22.510 status:reference:ntp:locked=true
2015-10-27-19:34:58.945 status:reference:ocxo_freq_control=4
2015-09-14-22:18:14.994 status:reference:steering:source_list:1=gps
2015-09-14-22:18:14.995 status:reference:steering:source_list:2>manual


```
2015-09-14-22:17:49.012 status:settings:dirty=false
2015-10-27-21:13:59.089 status:time=2015-10-27-21:13:59
2015-09-14-22:17:48.951 status:unit:network:MAC=00:1F:7B:54:00:91
2015-09-14-22:17:48.952 status:unit:network:broadcast=10.245.72.255
2015-09-14-22:17:48.952 status:unit:network:default_gateway=10.245.72.1
2015-09-14-22:17:48.952 status:unit:network:ip=10.245.72.78
2015-09-14-22:17:48.952 status:unit:network:netmask=255.255.255.0
2015-09-14-22:17:48.945 status:unit:serial_number=SYM35656
2015-10-27-21:13:56.053 status:unit:start=2015-10-27-19:32:26
2015-10-27-21:13:59.089 status:unit:uptime=1 hour, 41 minutes, 33 seconds
2015-09-14-22:17:48.893 status:unit:ver=0.1.1-rc5
```

5.4 TIC Card Results:

Port 2101 will provide an output each second for each active channel:

```
2015-08-08-18:27:10.168 status:t看_measurements:channel:31=2.471153846200000e-08
2015-08-08-18:27:09.097 status:t看_measurements:channel:32=7.450980391999999e-09
2015-08-08-18:27:11.156 status:t看_measurements:channel:33=7.259615384999999e-09
2015-08-08-18:27:01.268 status:t看_measurements:channel:34=7.065217391000000e-09
```

Port 2100 will provide an average [ptd_avg] for each active channel based on the ptdavg setting.
(settings:ptd_port:averaging_interval=NN)

```
Ch0 - Ch31 (10 event average): 13.394 ns 1320680521 S 495616 uS; sd: 0.046447 ns
Ch0 - Ch32 (10 event average): 6.856 ns 1320680521 S 496522 uS; sd: 0.064899 ns
Ch0 - Ch33 (10 event average): 14.623 ns 1320680521 S 497345 uS; sd: 0.000000 ns
Ch0 - Ch34 (10 event average): 19.322 ns 1320680521 S 497960 uS; sd: 0.081985 ns
```

Note: The TIC Measurement results are reported at the ptdavg value in seconds and will only be reported on those ports with ac active 1PPS input.

5.5 Events

As events occur and/or the system parameters change, these changes will be updated on the status port. If the value has not changed it will not be reported.

```
2015-08-08-18:03:46.374 status:kas2:frequency=-9.413934716757344e-15
2015-08-08-18:03:46.383 status:kas2:aging=-1.787710231776027e-23
2015-08-08-18:03:47.035 status:time=2015-08-08-18:03:47
2015-08-08-18:03:47.169 status:kas2:ptd=-2.302104007000000e-09
2015-08-08-18:03:47.185 status:t看_measurements:channel:32=6.521739129999999e-09
2015-08-08-18:03:47.217 status:t看_measurements:channel:33=1.490384615400000e-08
2015-08-08-18:03:47.232 status:t看_measurements:channel:31=1.375000000000000e-08
2015-08-08-18:03:47.287 status:gnss:auto_positioning:time_remaining=11 hours, 57 minutes
2015-08-08-18:03:47.391 status:kas2:phase=1.786788835591330e-09
2015-08-08-18:03:47.398 status:kas2:frequency=-9.964364537065904e-15
2015-08-08-18:03:47.406 status:kas2:aging=-1.791485859866313e-23
2015-08-08-18:03:48.158 status:t看_measurements:channel:31=1.365384615400000e-08
2015-08-08-18:03:48.181 status:time=2015-08-08-18:03:48
2015-08-08-18:03:48.201 status:unit:uptime=3 minutes, 11 seconds
2015-08-08-18:03:48.265 status:kas2:ptd=-2.219621141000000e-09
2015-08-08-18:03:49.091 status:time=2015-08-08-18:03:49
2015-08-08-18:03:49.186 status:kas2:ptd=-2.278327768000000e-09
2015-08-08-18:03:49.393 status:kas2:phase=1.780711335936088e-09
2015-08-08-18:03:49.401 status:kas2:frequency=-1.050833407897532e-14
2015-08-08-18:03:49.409 status:kas2:aging=-1.795219653132249e-23
2015-08-08-18:03:49.485 status:kas2:phase=1.774692450845072e-09
2015-08-08-18:03:49.492 status:kas2:frequency=-1.104745126336418e-14
2015-08-08-18:03:49.500 status:kas2:aging=-1.798921560321683e-23
2015-08-08-18:03:50.159 status:t看_measurements:channel:31=1.375000000000000e-08
2015-08-08-18:03:50.221 status:time=2015-08-08-18:03:50
```

Appendix A Julian Date Calendars

JULIAN DATE CALENDER (NON LEAP YEARS)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	001	032	060	091	121	152	182	213	244	274	305	335
2	002	033	061	092	122	153	183	214	245	275	306	336
3	003	034	062	093	123	154	184	215	246	276	307	337
4	004	035	063	094	124	155	185	216	247	277	308	338
5	005	036	064	095	125	156	186	217	248	278	309	339
6	006	037	065	096	126	157	187	218	249	279	310	340
7	007	038	066	097	127	158	188	219	250	280	311	341
8	008	039	067	098	128	159	189	220	251	281	312	342
9	009	040	068	099	129	160	190	221	252	282	313	343
10	010	041	069	100	130	161	191	222	253	283	314	344
11	011	042	070	101	131	162	192	223	254	284	315	345
12	012	043	071	102	132	163	193	224	255	285	316	346
13	013	044	072	103	133	164	194	225	256	286	317	347
14	014	045	073	104	134	165	195	226	257	287	318	348
15	015	046	074	105	135	166	196	227	258	288	319	349
16	016	047	075	106	136	167	197	228	259	289	320	350
17	017	048	076	107	137	168	198	229	260	290	321	351
18	018	049	077	108	138	169	199	230	261	291	322	352
19	019	050	078	109	139	170	200	231	262	292	323	353
20	020	051	079	110	140	171	201	232	263	293	324	354
21	021	052	080	111	141	172	202	233	264	294	325	355
22	022	053	081	112	142	173	203	234	265	295	326	356
23	023	054	082	113	143	174	204	235	266	296	327	357
24	024	055	083	114	144	175	205	236	267	297	328	358
25	025	056	084	115	145	176	206	237	268	298	329	359
26	026	057	085	116	146	177	207	238	269	299	330	360
27	027	058	086	117	147	178	208	239	270	300	331	361
28	028	059	087	118	148	179	209	240	271	301	332	362
29	029		088	119	149	180	210	241	272	302	333	363
30	030		089	120	150	181	211	242	273	303	334	364
31	031		090		151		212	243		304		365

JULIAN DATE CALENDAR (LEAP YEARS ONLY)

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	001	032	061	092	122	153	183	214	245	275	306	336
2	002	033	062	093	123	154	184	215	246	276	307	337
3	003	034	063	094	124	155	185	216	247	277	308	338
4	004	035	064	095	125	156	186	217	248	278	309	339
5	005	036	065	096	126	157	187	218	249	279	310	340
6	006	037	066	097	127	158	188	219	250	280	311	341
7	007	038	067	098	128	159	189	220	251	281	312	342
8	008	039	068	099	129	160	190	221	252	282	313	343
9	009	040	069	100	130	161	191	222	253	283	314	344
10	010	041	070	101	131	162	192	223	254	284	315	345
11	011	042	071	102	132	163	193	224	255	285	316	346
12	012	043	072	103	133	164	194	225	256	286	317	347
13	013	044	073	104	134	165	195	226	257	287	318	348
14	014	045	074	105	135	166	196	227	258	288	319	349
15	015	046	075	106	136	167	197	228	259	289	320	350
16	016	047	076	107	137	168	198	229	260	290	321	351
17	017	048	077	108	138	169	199	230	261	291	322	352
18	018	049	078	109	139	170	200	231	262	292	323	353
19	019	050	079	110	140	171	201	232	263	293	324	354
20	020	051	080	111	141	172	202	233	264	294	325	355
21	021	052	081	112	142	173	203	234	265	295	326	356
22	022	053	082	113	143	174	204	235	266	296	327	357
23	023	054	083	114	144	175	205	236	267	297	328	358
24	024	055	084	115	145	176	206	237	268	298	329	359
25	025	056	085	116	146	177	207	238	269	299	330	360
26	026	057	086	117	147	178	208	239	270	300	331	361
27	027	058	087	118	148	179	209	240	271	301	332	362
28	028	059	088	119	149	180	210	241	272	302	333	363
29	029	060	089	120	150	181	211	242	273	303	334	364
30	030		090	121	151	182	212	243	274	304	335	365
31	031		091		152		213	244		305		366

Appendix B Software Licences

This product contains licensed third party software, including software available under the GPL licensing scheme. You can obtain these licenses and the open-source software by contacting Microsemi Technical support at the following numbers:

- Worldwide (Main Number): 1-408-428-7907
- USA, Canada, Latin America including Caribbean, Pacific Rim including Asia,
- Australia and New Zealand: 1-408-428-7907
- USA toll-free: 1-888-367-7966
- Europe, Middle East & Africa: 49 700 32886435

An administrative fee may be charged to obtain the source code.

By using the SyncSystem 4380A, the user agrees to the terms of these licenses.

Thrid pary Software:

The following is a list of third-party software applications provided with the SyncSystem4380A.

```
PACKAGE NAME: base-files
PACKAGE VERSION: 3.0.14
RECIPE NAME: base-files
LICENSE: GPLv2
```

```
PACKAGE NAME: base-passwd
PACKAGE VERSION: 3.5.29
RECIPE NAME: base-passwd
LICENSE: GPLv2+
```

```
PACKAGE NAME: bash
PACKAGE VERSION: 4.3
RECIPE NAME: bash
LICENSE: GPLv3+
```

```
PACKAGE NAME: busybox
PACKAGE VERSION: 1.23.1
RECIPE NAME: busybox
LICENSE: GPLv2 & bzip2
```

```
PACKAGE NAME: busybox-udhcp
PACKAGE VERSION: 1.23.1
RECIPE NAME: busybox
LICENSE: GPLv2 & bzip2
```

```
PACKAGE NAME: bzip2
PACKAGE VERSION: 1.0.6
RECIPE NAME: bzip2
LICENSE: bzip2
```

```
PACKAGE NAME: ca-certificates
PACKAGE VERSION: 20141019
RECIPE NAME: ca-certificates
LICENSE: GPL-2.0+ & MPL-2.0
```

```
PACKAGE NAME: dbus-1
PACKAGE VERSION: 1.8.10
RECIPE NAME: dbus
LICENSE: AFL-2 | GPLv2+
```

```
PACKAGE NAME: e2fsprogs-e2fsck
PACKAGE VERSION: 1.42.9
RECIPE NAME: e2fsprogs
LICENSE: GPLv2
```

```
PACKAGE NAME: e2fsprogs-mke2fs
PACKAGE VERSION: 1.42.9
```




```
RECIPE NAME: e2fsprogs
LICENSE: GPLv2

PACKAGE NAME: elfutils
PACKAGE VERSION: 0.161
RECIPE NAME: elfutils
LICENSE: (GPLv3 & Elfutils-Exception)

PACKAGE NAME: findutils
PACKAGE VERSION: 4.5.14
RECIPE NAME: findutils
LICENSE: GPLv3+

PACKAGE NAME: glibc-binary-localedata-en-gb
PACKAGE VERSION: 2.21
RECIPE NAME: glibc-locale
LICENSE: GPLv2 & LGPLv2.1

PACKAGE NAME: glibc-binary-localedata-en-us
PACKAGE VERSION: 2.21
RECIPE NAME: glibc-locale
LICENSE: GPLv2 & LGPLv2.1

PACKAGE NAME: glibc-locale-en-gb
PACKAGE VERSION: 2.21
RECIPE NAME: glibc-locale
LICENSE: GPLv2 & LGPLv2.1

PACKAGE NAME: i2c-tools
PACKAGE VERSION: 3.1.1
RECIPE NAME: i2c-tools
LICENSE: GPLv2+

PACKAGE NAME: i2c-tools-misc
PACKAGE VERSION: 3.1.1
RECIPE NAME: i2c-tools
LICENSE: GPLv2+

PACKAGE NAME: init-ifupdown
PACKAGE VERSION: 1.0
RECIPE NAME: init-ifupdown
LICENSE: GPLv2

PACKAGE NAME: kmod
PACKAGE VERSION: 19+gitAUTOINC+fd56638aed
RECIPE NAME: kmod
LICENSE: GPL-2.0+ & LGPL-2.1+

PACKAGE NAME: ldd
PACKAGE VERSION: 2.21
RECIPE NAME: glibc
LICENSE: GPLv2 & LGPLv2.1

PACKAGE NAME: less
PACKAGE VERSION: 471
RECIPE NAME: less
LICENSE: GPLv3+ | BSD-2-Clause

PACKAGE NAME: libacl1
PACKAGE VERSION: 2.2.52
RECIPE NAME: acl
LICENSE: LGPLv2.1+

PACKAGE NAME: libarchive-bin
PACKAGE VERSION: 3.1.2
RECIPE NAME: libarchive
LICENSE: BSD

PACKAGE NAME: libattr1
PACKAGE VERSION: 2.4.47
RECIPE NAME: attr
```



```
LICENSE: LGPLv2.1+

PACKAGE NAME: libblkid1
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: libbsd0
PACKAGE VERSION: 0.7.0
RECIPE NAME: libbsd
LICENSE: BSD-4-Clause & MIT

PACKAGE NAME: libbz2-0
PACKAGE VERSION: 1.0.6
RECIPE NAME: bzip2
LICENSE: bzip2

PACKAGE NAME: libc6
PACKAGE VERSION: 2.21
RECIPE NAME: glibc
LICENSE: GPLv2 & LGPLv2.1

PACKAGE NAME: libcap2
PACKAGE VERSION: 2.24
RECIPE NAME: libcap
LICENSE: BSD | GPLv2

PACKAGE NAME: libcom-err2
PACKAGE VERSION: 1.42.9
RECIPE NAME: e2fsprogs
LICENSE: GPLv2 & LGPLv2 & BSD & MIT

PACKAGE NAME: libcrypto1.0.0
PACKAGE VERSION: 1.0.2a
RECIPE NAME: openssl
LICENSE: openssl

PACKAGE NAME: libcurl5
PACKAGE VERSION: 7.40.0
RECIPE NAME: curl
LICENSE: MIT

PACKAGE NAME: libdbus-1-3
PACKAGE VERSION: 1.8.10
RECIPE NAME: dbus
LICENSE: AFL-2 | GPLv2+

PACKAGE NAME: libdw1
PACKAGE VERSION: 0.161
RECIPE NAME: elfutils
LICENSE: (GPLv3 & Elfutils-Exception)

PACKAGE NAME: libe2p2
PACKAGE VERSION: 1.42.9
RECIPE NAME: e2fsprogs
LICENSE: GPLv2 & LGPLv2 & BSD & MIT

PACKAGE NAME: libelf1
PACKAGE VERSION: 0.161
RECIPE NAME: elfutils
LICENSE: (GPLv3 & Elfutils-Exception)

PACKAGE NAME: libestr0
PACKAGE VERSION: 0.1.6
RECIPE NAME: libestr
LICENSE: LGPLv2.1

PACKAGE NAME: libevent
PACKAGE VERSION: 2.0.21
RECIPE NAME: libevent
LICENSE: BSD
```



PACKAGE NAME: libexpat1
PACKAGE VERSION: 2.1.0
RECIPE NAME: expat
LICENSE: MIT

PACKAGE NAME: libext2fs2
PACKAGE VERSION: 1.42.9
RECIPE NAME: e2fsprogs
LICENSE: GPLv2 & LGPLv2 & BSD & MIT

PACKAGE NAME: libgcc1
PACKAGE VERSION: 4.9.2
RECIPE NAME: libgcc
LICENSE: GPL-3.0-with-GCC-exception

PACKAGE NAME: libgcrypt
PACKAGE VERSION: 1.6.2
RECIPE NAME: libgcrypt
LICENSE: GPLv2+ & LGPLv2.1+

PACKAGE NAME: libgmp10
PACKAGE VERSION: 6.0.0
RECIPE NAME: gmp
LICENSE: GPLv2 | LGPLv3

PACKAGE NAME: libgnutls28
PACKAGE VERSION: 3.3.12
RECIPE NAME: gnutls
LICENSE: LGPLv2.1+

PACKAGE NAME: libgpg-error0
PACKAGE VERSION: 1.18
RECIPE NAME: libgpg-error
LICENSE: GPLv2+ & LGPLv2.1+

PACKAGE NAME: libjson-c2
PACKAGE VERSION: 0.12
RECIPE NAME: json-c
LICENSE: MIT

PACKAGE NAME: libkmod2
PACKAGE VERSION: 19+gitAUTOINC+fd56638aed
RECIPE NAME: kmod
LICENSE: LGPL-2.1+

PACKAGE NAME: liblzma5
PACKAGE VERSION: 5.2.0
RECIPE NAME: xz
LICENSE: PD

PACKAGE NAME: libmount1
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: libncurses5
PACKAGE VERSION: 5.9
RECIPE NAME: ncurses
LICENSE: MIT

PACKAGE NAME: libncursesw5
PACKAGE VERSION: 5.9
RECIPE NAME: ncurses
LICENSE: MIT

PACKAGE NAME: libnfsidmap0
PACKAGE VERSION: 0.25
RECIPE NAME: libnfsidmap
LICENSE: BSD



PACKAGE NAME: libpcap1
PACKAGE VERSION: 1.6.2
RECIPE NAME: libpcap
LICENSE: BSD

PACKAGE NAME: libperl5
PACKAGE VERSION: 5.20.0
RECIPE NAME: perl
LICENSE: Artistic-1.0 | GPL-1.0+

PACKAGE NAME: libpopt0
PACKAGE VERSION: 1.16
RECIPE NAME: popt
LICENSE: MIT

PACKAGE NAME: libpython2.7-1.0
PACKAGE VERSION: 2.7.9
RECIPE NAME: python
LICENSE: PSFv2

PACKAGE NAME: libreadline6
PACKAGE VERSION: 6.3
RECIPE NAME: readline
LICENSE: GPLv3+

PACKAGE NAME: libsmartcols1
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: libssl1.0.0
PACKAGE VERSION: 1.0.2a
RECIPE NAME: openssl
LICENSE: openssl

PACKAGE NAME: libstdc++6
PACKAGE VERSION: 4.9.2
RECIPE NAME: gcc-runtime
LICENSE: GPL-3.0-with-GCC-exception

PACKAGE NAME: libsystemd0
PACKAGE VERSION: 219-stable+gitAUTOINC+85a6fabdd3
RECIPE NAME: systemd
LICENSE: GPLv2 & LGPLv2.1 & MIT

PACKAGE NAME: libtinfo5
PACKAGE VERSION: 5.9
RECIPE NAME: ncurses
LICENSE: MIT

PACKAGE NAME: libtirpc1
PACKAGE VERSION: 0.2.5
RECIPE NAME: libtirpc
LICENSE: BSD

PACKAGE NAME: libudev1
PACKAGE VERSION: 219-stable+gitAUTOINC+85a6fabdd3
RECIPE NAME: systemd
LICENSE: GPLv2 & LGPLv2.1 & MIT

PACKAGE NAME: libusb-1.0-0
PACKAGE VERSION: 1.0.19
RECIPE NAME: libusb1
LICENSE: LGPLv2.1+

PACKAGE NAME: libuuid1
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: libwrap0



PACKAGE VERSION: 7.6
RECIPE NAME: tcp-wrappers
LICENSE: BSD

PACKAGE NAME: libx11-6
PACKAGE VERSION: 1.6.2
RECIPE NAME: libx11
LICENSE: MIT & MIT-style & BSD

PACKAGE NAME: libxau6
PACKAGE VERSION: 1.0.8
RECIPE NAME: libxau
LICENSE: MIT-style

PACKAGE NAME: libxcb-xkb1
PACKAGE VERSION: 1.11
RECIPE NAME: libxcb
LICENSE: MIT

PACKAGE NAME: libxcb1
PACKAGE VERSION: 1.11
RECIPE NAME: libxcb
LICENSE: MIT

PACKAGE NAME: libxdmcp6
PACKAGE VERSION: 1.1.1
RECIPE NAME: libxdmcp
LICENSE: MIT-style

PACKAGE NAME: libxkbcommon
PACKAGE VERSION: 0.5.0
RECIPE NAME: libxkbcommon
LICENSE: MIT & MIT-style

PACKAGE NAME: libz1
PACKAGE VERSION: 1.2.8
RECIPE NAME: zlib
LICENSE: Zlib

PACKAGE NAME: locale-base-en-gb
PACKAGE VERSION: 2.21
RECIPE NAME: glibc-locale
LICENSE: GPLv2 & LGPLv2.1

PACKAGE NAME: locale-base-en-us
PACKAGE VERSION: 2.21
RECIPE NAME: glibc-locale
LICENSE: GPLv2 & LGPLv2.1

PACKAGE NAME: logrotate
PACKAGE VERSION: 3.8.8
RECIPE NAME: logrotate
LICENSE: GPLv2

PACKAGE NAME: ltrace
PACKAGE VERSION: 7.2+gitAUTOINC+f44b284219
RECIPE NAME: ltrace
LICENSE: GPLv2

PACKAGE NAME: lua
PACKAGE VERSION: 5.2.2
RECIPE NAME: lua
LICENSE: MIT

PACKAGE NAME: ncurses-terminfo-base
PACKAGE VERSION: 5.9
RECIPE NAME: ncurses
LICENSE: MIT

PACKAGE NAME: netbase
PACKAGE VERSION: 5.3



RECIPE NAME: netbase
LICENSE: GPLv2

PACKAGE NAME: netcat
PACKAGE VERSION: 0.7.1
RECIPE NAME: netcat
LICENSE: GPLv2

PACKAGE NAME: nettle
PACKAGE VERSION: 2.7.1
RECIPE NAME: nettle
LICENSE: LGPLv2.1 & GPLv2

PACKAGE NAME: nfs-utils-client
PACKAGE VERSION: 1.3.1
RECIPE NAME: nfs-utils
LICENSE: MIT & GPLv2+ & BSD

PACKAGE NAME: ntp
PACKAGE VERSION: 4.2.8p3
RECIPE NAME: ntp
LICENSE: NTP

PACKAGE NAME: ntp-tickadj
PACKAGE VERSION: 4.2.8p3
RECIPE NAME: ntp
LICENSE: NTP

PACKAGE NAME: ntp-utils
PACKAGE VERSION: 4.2.8p3
RECIPE NAME: ntp
LICENSE: NTP

PACKAGE NAME: ntpdate
PACKAGE VERSION: 4.2.8p3
RECIPE NAME: ntp
LICENSE: NTP

PACKAGE NAME: openssh
PACKAGE VERSION: 6.7p1
RECIPE NAME: openssh
LICENSE: BSD

PACKAGE NAME: openssh-keygen
PACKAGE VERSION: 6.7p1
RECIPE NAME: openssh
LICENSE: BSD

PACKAGE NAME: openssh-scp
PACKAGE VERSION: 6.7p1
RECIPE NAME: openssh
LICENSE: BSD

PACKAGE NAME: openssh-ssh
PACKAGE VERSION: 6.7p1
RECIPE NAME: openssh
LICENSE: BSD

PACKAGE NAME: openssh-sshd
PACKAGE VERSION: 6.7p1
RECIPE NAME: openssh
LICENSE: BSD

PACKAGE NAME: openssl-conf
PACKAGE VERSION: 1.0.2a
RECIPE NAME: openssl
LICENSE: openssl

PACKAGE NAME: os-release
PACKAGE VERSION: 1.0
RECIPE NAME: os-release



LICENSE: MIT

PACKAGE NAME: packagegroup-core-boot
PACKAGE VERSION: 1.0
RECIPE NAME: packagegroup-core-boot
LICENSE: MIT

PACKAGE NAME: packagegroup-core-ssh-openssh
PACKAGE VERSION: 1.0
RECIPE NAME: packagegroup-core-ssh-openssh
LICENSE: MIT

PACKAGE NAME: parted
PACKAGE VERSION: 3.2
RECIPE NAME: parted
LICENSE: GPLv3+

PACKAGE NAME: perl
PACKAGE VERSION: 5.20.0
RECIPE NAME: perl
LICENSE: Artistic-1.0 | GPL-1.0+

PACKAGE NAME: pps-tools
PACKAGE VERSION: 0.0.0+gitAUTOINC+0deb9c7e13
RECIPE NAME: pps-tools
LICENSE: GPLv2

PACKAGE NAME: procps
PACKAGE VERSION: 3.3.10
RECIPE NAME: procps
LICENSE: GPLv2+ & LGPLv2+

PACKAGE NAME: python-core
PACKAGE VERSION: 2.7.9
RECIPE NAME: python
LICENSE: PSFv2

PACKAGE NAME: python-lang
PACKAGE VERSION: 2.7.9
RECIPE NAME: python
LICENSE: PSFv2

PACKAGE NAME: python-re
PACKAGE VERSION: 2.7.9
RECIPE NAME: python
LICENSE: PSFv2

PACKAGE NAME: python-readline
PACKAGE VERSION: 2.7.9
RECIPE NAME: python
LICENSE: PSFv2

PACKAGE NAME: rpcbind
PACKAGE VERSION: 0.2.2
RECIPE NAME: rpcbind
LICENSE: BSD

PACKAGE NAME: rsyslog
PACKAGE VERSION: 7.4.4
RECIPE NAME: rsyslog
LICENSE: GPLv3 & LGPLv3 & Apache-2.0

PACKAGE NAME: run-postinsts
PACKAGE VERSION: 1.0
RECIPE NAME: run-postinsts
LICENSE: MIT

PACKAGE NAME: shadow
PACKAGE VERSION: 4.2.1
RECIPE NAME: shadow
LICENSE: BSD | Artistic-1.0



PACKAGE NAME: shadow-base
PACKAGE VERSION: 4.2.1
RECIPE NAME: shadow
LICENSE: BSD | Artistic-1.0

PACKAGE NAME: shadow-securetty
PACKAGE VERSION: 4.2.1
RECIPE NAME: shadow-securetty
LICENSE: MIT

PACKAGE NAME: socat
PACKAGE VERSION: 1.7.2.4
RECIPE NAME: socat
LICENSE: GPL-2.0+-with-OpenSSL-exception

PACKAGE NAME: strace
PACKAGE VERSION: 4.9
RECIPE NAME: strace
LICENSE: BSD

PACKAGE NAME: sudo
PACKAGE VERSION: 1.8.11p2
RECIPE NAME: sudo
LICENSE: ISC & BSD & Zlib

PACKAGE NAME: systemd
PACKAGE VERSION: 219-stable+gitAUTOINC+85a6fabdd3
RECIPE NAME: systemd
LICENSE: GPLv2 & LGPLv2.1 & MIT

PACKAGE NAME: systemd-compat-units
PACKAGE VERSION: 1.0
RECIPE NAME: systemd-compat-units
LICENSE: MIT

PACKAGE NAME: systemd-serialgetty
PACKAGE VERSION: 1.0
RECIPE NAME: systemd-serialgetty
LICENSE: GPLv2+

PACKAGE NAME: tcpdump
PACKAGE VERSION: 4.6.1
RECIPE NAME: tcpdump
LICENSE: BSD

PACKAGE NAME: udev
PACKAGE VERSION: 219-stable+gitAUTOINC+85a6fabdd3
RECIPE NAME: systemd
LICENSE: GPLv2 & LGPLv2.1 & MIT

PACKAGE NAME: udev-hwdb
PACKAGE VERSION: 219-stable+gitAUTOINC+85a6fabdd3
RECIPE NAME: systemd
LICENSE: GPLv2 & LGPLv2.1 & MIT

PACKAGE NAME: update-alternatives-opkg
PACKAGE VERSION: 0.1.8+gitAUTOINC+53274f0875
RECIPE NAME: opkg-utils
LICENSE: GPLv2+

PACKAGE NAME: update-rc.d
PACKAGE VERSION: 0.7
RECIPE NAME: update-rc.d
LICENSE: GPLv2+

PACKAGE NAME: usbutils
PACKAGE VERSION: 008
RECIPE NAME: usbutils
LICENSE: GPLv2+



```
PACKAGE NAME: util-linux
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: util-linux-agetty
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: util-linux-cfdisk
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: util-linux-fdisk
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: util-linux-fsck
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: util-linux-losetup
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: util-linux-mkfs
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: util-linux-mount
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: util-linux-readprofile
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: util-linux-sfdisk
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: util-linux-sulogin
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: util-linux-swaponoff
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: util-linux-umount
PACKAGE VERSION: 2.25.2
RECIPE NAME: util-linux
LICENSE: GPLv2+ & LGPLv2.1+ & BSD

PACKAGE NAME: volatile-binds
PACKAGE VERSION: 1.0
RECIPE NAME: volatile-binds
LICENSE: MIT
```